

# FLIGHT

The  
AIRCRAFT  
ENGINEER  
&  
AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

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## Flight

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## DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list :-

1925	
Sept. 5	.... "Flight" Challenge Cup for Models at Sudbury.
Sept. 19-28	F.I.A. Conference at Prague.
Oct. 1	.... Maj.-Gen. Sir Sefton Brancker, K.C.B., A.F.C. "The Technical Lesson of Five Years of Air Transport," before R.Ae.S.
Oct. 8	.... Aero Golfing Soc. Autumn Meeting, Walton Heath.
Oct. 15	.... Maj. C. K. Cochran-Patrick, D.S.O., M.C. "Aircraft Survey in Burma," before R.Ae.S.
Oct. 24-29	Schneider Cup Race, Baltimore, U.S.A.
Oct. 29	.... Mr. W. L. Cowley. "Aircraft Transport Economy," before R.Ae.S.
Nov. 3	.... Sir Dugald Clerk, K.B.E., F.R.S., D.Sc., M.I.M.E., M.I.C.E., F.R.Ae.S. "Supercharging," before R.Ae.S.

## EDITORIAL COMMENT.



Of all the International air contests, few appeal more strongly than that for the Schneider Seaplane Trophy, which is, of course, the speed race of the world for machines of the seaplane type. The history of the Schneider Cup race will probably be familiar to the majority of our readers, but, for the benefit of those who have not followed aviation from its earlier days, it may be recalled that the Cup has been held twice by Great Britain. The first time a British machine and pilot lifted the Cup was at Monaco in 1914, when Mr. Howard Pixton won a smashing victory over the French competitors, flying a Sopwith twin-float seaplane fitted with Gnome engine. Then came the war 1914-18, when, of course, the race for the coveted seaplane trophy could not be held, and it was not until 1919 that the next Schneider Cup race took place. That year's race was held off Bournemouth, in extremely misty weather which caused the majority of the competitors to abandon the race. The only exception was Janello, on a Savoia flying-boat, who completed the course, and was awarded the Cup, although there was considerable difference of opinion as to whether or not he had correctly rounded the mark boats, the weather being so thick that it was difficult to make accurate observations. The Schneider Cup then remained in Italy until 1922, when the race was won by Capt. H. Biard, on a Supermarine flying boat, with Napier "Lion" engine.

As a result of Biard's winning the Cup, the 1923 Schneider Race was held in England, and was won by the American pilot, Lieut. Rittenhouse, on a Curtiss Navy twin-float seaplane with Curtiss D.12 engine. The 1924 Schneider Cup race was to be held at Baltimore, U.S.A., but in this Great Britain was not represented, the machine designed and built for the race by the Gloucestershire Aircraft Co. having been damaged in a test flight.

This year, fortunately, there is every chance that

this country will be worthily represented in the Schneider Cup race, as two British machines have been entered for the contest. Both of these have been ordered by the Air Ministry for technical development purposes, but the Air Ministry has agreed to lend the two machines to the firms which have constructed them, provided certain specified performances are obtained, the stipulated performances being such as to give, if attained, the machines a reasonable chance in the race. What the stipulated speed is cannot be mentioned at the moment, since publication of the figures would obviously be unfair both to the Air Ministry and the constructors. It may be stated, however, without giving actual figures, that if the machines are, in fact, lent to the constructors for the purpose of being taken to the States, it may be taken for granted that their performance is such as to give definite promise of a good chance to bring the Cup back to Great Britain.

Concerning the machines themselves, little may be said at the moment, but it is common knowledge that both are fitted with Napier engines. Also that the Supermarine "S.4" is a monoplane, while the "Gloster III" is a biplane. More than this it is not possible to say at the moment. The "Gloster III" was tested by Capt. Hubert Broad on Sunday last, and is reported to have flown extremely well and to give very great promise. The Supermarine "S.4" will be piloted by Capt. Biard, who has had it out a

couple of times and has found it to be very fast indeed.

Compared with previous years, it can, we think, be said that this year the position is very satisfactory. Not only has the Air Ministry ordered the racers "for technical development purposes," but the machines have been finished in fairly good time, and if we do send the two challengers to America there is at least the satisfaction of knowing that we are not sending entirely untried experimental machines, but that they have demonstrated before leaving that they are worthy to uphold British prestige on "the other side." The Americans have this great advantage, that they have been able to carry out several years of development work, and have enjoyed generous support from their Government. On the other hand, both the British constructing firms have had long experience, the Gloucestershire Aircraft Co. of racing aeroplanes, and the Supermarine Aviation Works of seaplane design and construction. There is therefore, every reason to believe the contest will be a very close one, the more so as the Napier engines have undergone such development as has resulted in the power being increased to a figure which is little short of astonishing.

The next week or two will show whether Great Britain is likely to have a sporting chance of bringing back the Cup, and, personally, although we fully realise all that the challengers are up against, we are hopeful of success.

## Two French Long-Distance Flights

On August 29, Capt. Radovitch, flying a Breguet XIX (400 h.p. Lorraine-Dietrich), accomplished a non-stop flight from Paris to Belgrade, via Turin and Venice. He covered the 1,100 miles in 9 hrs. 25 mins. Another fine non-stop flight was made on August 31, when M. Daniel Julien flew from Paris to Madrid (845 miles) in 6 hrs. 55 mins. His machine was a Potez biplane (450 h.p. Lorraine-Dietrich).

## New Franco-Swiss Air Service

A DAILY air service is now in operation, for passengers and goods, between Lyons, Geneva, and Basel.

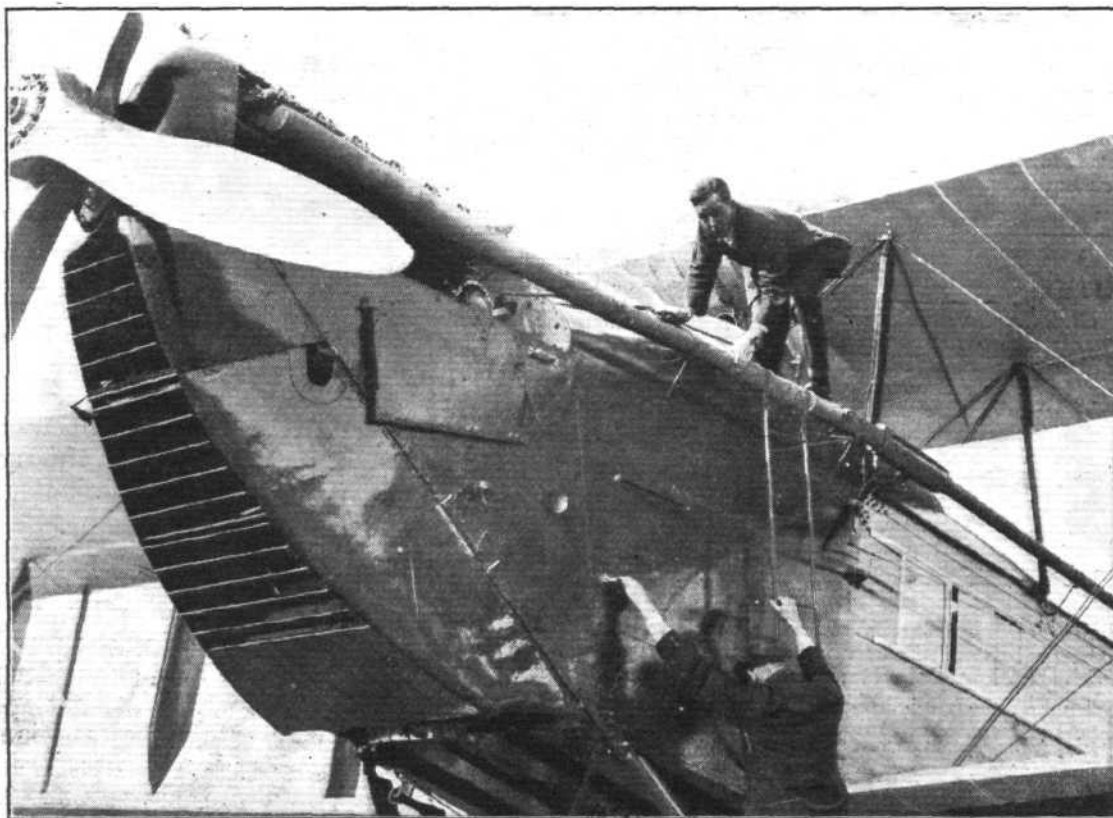
## Melbourne-Tokyo Flight

MAJ. THE MARQUIS DE PINEDO, who is continuing his Rome-Melbourne-Tokyo flight on a Savoia S.16 *ter* flying boat, reached Manilla on August 27, but is held up there by severe typhoons.

## Russian Aviators Missing

Two Russian Soviet pilots, who left Archangelsk on August 15 (flying Junkers seaplanes) for Kolguev in connection with an expedition to the White Sea, are missing, and it is feared that they lost their bearings in a fog.

As Long as it is Broad: This photograph of the nose of the D.H. 54, or "High-clere" as the machine has been officially named, showing Capt. Broad getting into the cockpit, gives a good idea of the size of this latest de Havilland air liner, which is fitted with a Rolls-Royce "Condor" engine of 650 h.p.



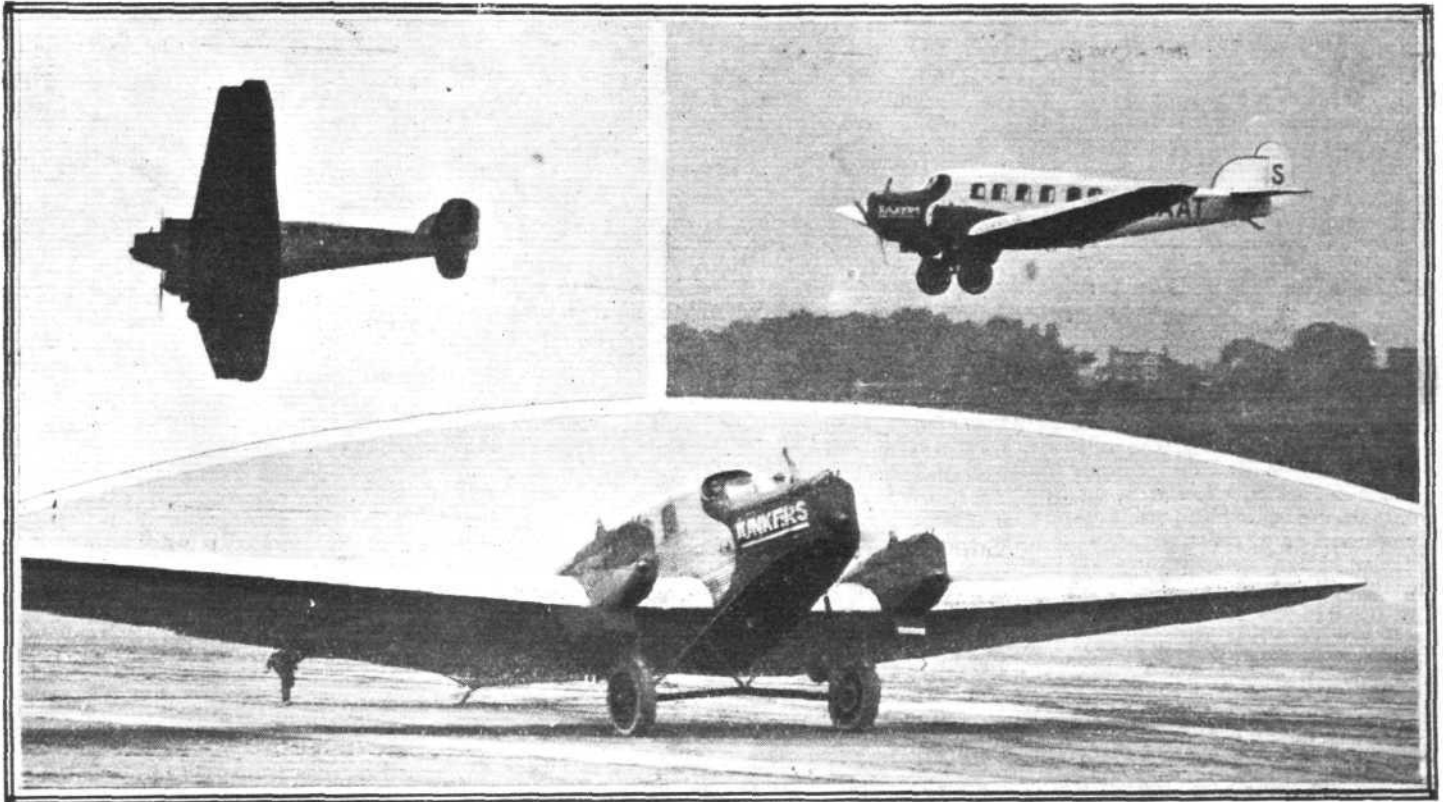
## THE JUNKERS G.24.L

### Latest German Three-Engined Passenger Aeroplane

AN interesting visitor to the Croydon aerodrome during last week was a large three-engined Junkers monoplane; interesting partly because of the fact that the machine brought over close upon £10,000,000 worth of bonds, and even more so because this is the first time that the latest type of Junkers passenger carrier has been seen at a British aerodrome.

Photographs of the machine have previously been published

passengers were carried: Dr. H. H. Hagemann, who is manager of the Junkers Company, Herr Geheimrat, Hientzsche, and Herr Sommerlad, officials of the German Debt Commission. These officials supervised the transfer of the sealed boxes containing the bonds from the aeroplane to motors conveying them to the Bank of England, and later the same officials attended at the breaking of the seals and the



**THE JUNKERS G.24.L :** Three views of the machine, flying overhead, coming in to land, and taxi-ing up to the Customs House at Croydon.

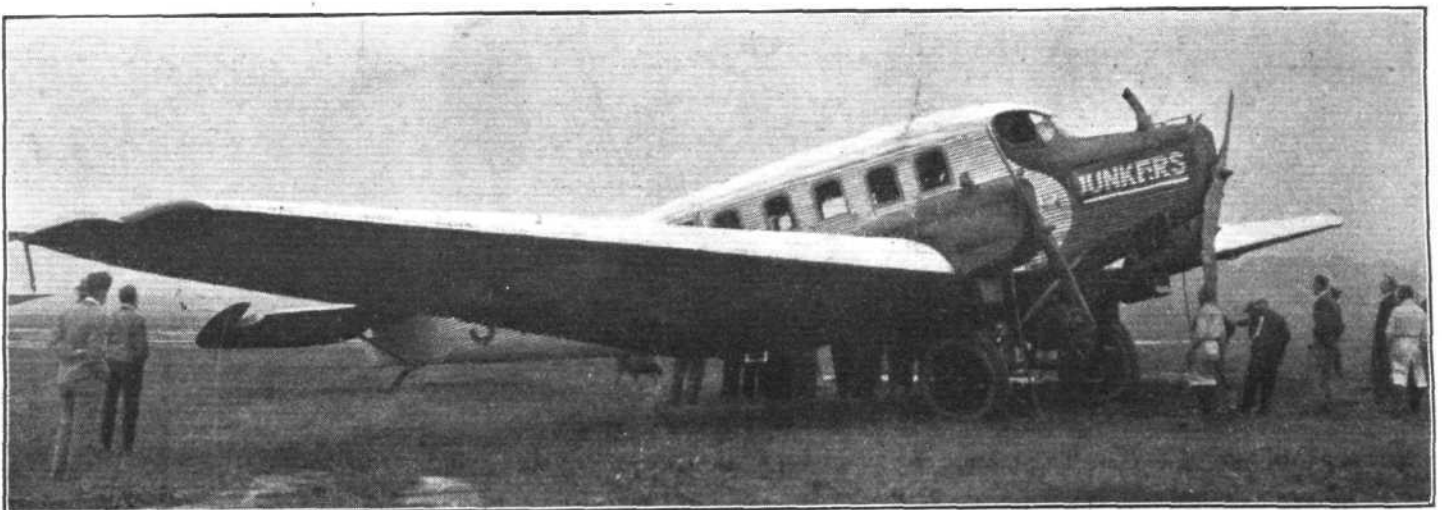
in *FLIGHT*, but a considerable number of further particulars have now become available, which should be found of no inconsiderable interest.

The Junkers monoplane, which has been built, under licence, by the A. B. Flygindustri, Limhamn, Sweden, arrived at Croydon about noon on Tuesday of last week, carrying, as already stated, Reparations Bonds to the value of £9,660,000. Originally, it had been intended that the Junkers machine should arrive with its valuable cargo on Monday of last week, but bad weather delayed the arrival until Tuesday. The machine was piloted on this flight by Mr. Linner, the well-known Swedish pilot, and the following

counting of the bonds. The fact that air transport should be regarded as the safest mode of conveyance for such valuable cargo is significant.

#### The G.24.L Aeroplane

The three-engined Junkers commercial monoplane is produced in several types. The one permitted in Germany is known as the G.23.L, and is driven by a 195 h.p. Junkers L.2 engine, mounted in the nose of the fuselage, and two 100 h.p. Mercedes engines, mounted on the wings; the total power developed by this combination being the maximum permitted German aircraft. When built abroad, however,



**THE JUNKERS G.24.L :** This was the machine which recently brought over German bonds to the value of £10,000,000. The three engines are Junkers L.2 developing 230 h.p. each.



**THE JUNKERS G.24.L :** This side view gives a good idea of the cabin, and the men standing in front of the machine give scale to the picture

the machine may be fitted with more powerful engines, one combination being that found on the Swedish-built machine which visited Croydon, and which was equipped with three 230 h.p. Junkers engines of the L.2 type.

An unusual and interesting feature of the design of the G.24 is that the machine, apart from changes in individual engine units, can be used either as a single-engined, twin-engined, or three-engined monoplane, the wings being so designed that when the two-wing engine units are removed, with their length of wing surfaces, the two end pieces of the wings can be moved inwards a corresponding amount, the wing surface being thus somewhat decreased and the machine turned into an ordinary single-engined low-wing monoplane. If desired a more powerful engine can then be fitted in the nose, and among those given as possible power plants for this purpose is the 450 h.p. Napier "Lion."

Conversely, if the machine is preferred as a twin-engined type, the central engine unit can be removed, a streamline nose being fitted in its place, and the machine then becomes a normal twin-engined monoplane, again with a choice of engines within certain limits of power, and subject to structural considerations.

It might have been thought that all these changes represented the maximum possible in the matter of adapting any given type of machine to a variety of purposes and conditions, but there is a further series of changes possible by which the machine is turned into a seaplane. This has actually been done, and, we understand, very successfully done, and two photographs published on another page show the machine converted in this way. Presumably, the same changes to twin and single engine could be made in the seaplane type, so that it would seem that in the G.23 and all its modifications, Professor Junkers has produced a type with almost endless possibilities.

The following description should be taken to refer to the Swedish-built machine that visited Croydon, and which is

now in use on the Amsterdam-Hamburg-Copenhagen-Malmö service of the Aero Transport Co., of Stockholm.

In constructional design the Junkers G.24.L is similar to the smaller, single-engined Junkers machines which are already familiar to readers of *FLIGHT*. That is to say, all-metal construction is employed, even to the fuselage and wing covering, which is in the form of corrugated sheet Duralumin. A feature of the wing construction of all Junkers machines, and which has been retained in the G.24, is the use of tubular spars and the entire absence of wing ribs. The tubular wing spars are placed against the top and bottom wing surfaces at fairly close intervals, and are connected by lengths of corrugated strip, riveted to the sides of the tubes.

It would appear to be impossible to calculate the strength of such a wing by ordinary methods, but we believe that the Junkers Company have, as a result of a great number of sand loading tests, succeeded in evolving empirical formulæ, which enables the strength of the wing in bending and torsion to be calculated very accurately. The wing structure is, of course, to a great extent redundant, and the argument advanced against criticism of the wing design is, that a large number of the corrugated strips could probably be broken without materially decreasing the strength of the wing, as the loads would be taken up by the other members, much as in our better known biplane structures, the incidence bracing takes over the function of a front or rear lift wire, should one of the latter break.

The wing engines are mounted on engine bearers built integral with the wing structure, the entire section of wing being built as a separate unit and removed with the engine, so that the effect of removing the two wing engines and replacing the two end sections is to shorten the wing span by an amount equal to the width of the two wing-engine sections. From the photographs it will be noticed that the wing engines are carefully cowled-in, with the fairing



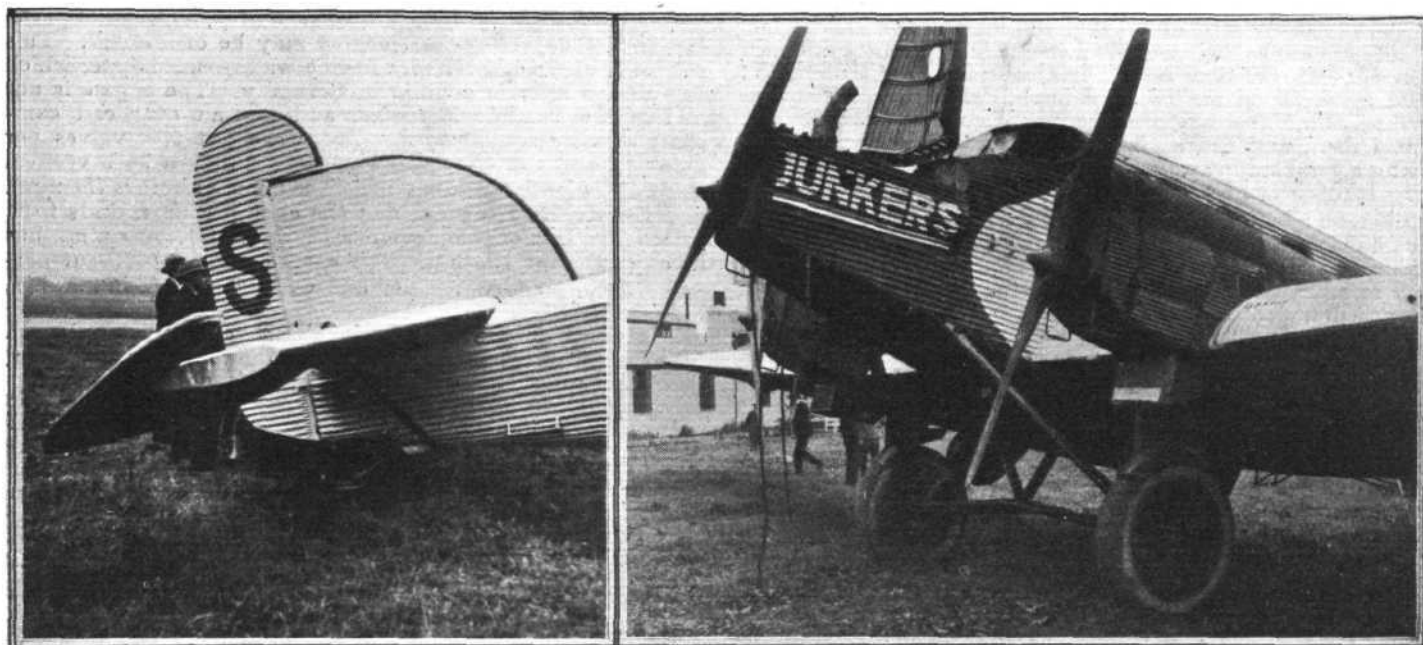
**THE JUNKERS G.24.L :** Three-quarter rear view. Note how the wing engine cowling is faired into the wing surface

behind the engines merging gradually into the upper wing surface.

In shape and construction, the fuselage of the G.24 is similar to that of the smaller, single-engined type, the curved cabin roof sweeping down towards the central engine, and the two pilots being placed between the cabin and the front engine.

and the risk of forced landings outside a suitable aerodrome should, therefore, be distinctly remote, the more so as, normally, the machine cruises at a speed corresponding to, approximately, 70 per cent. of the full engine power.

The cabin, which has seating accommodation for ten passengers, is panelled in mahogany, and comfortable armchairs

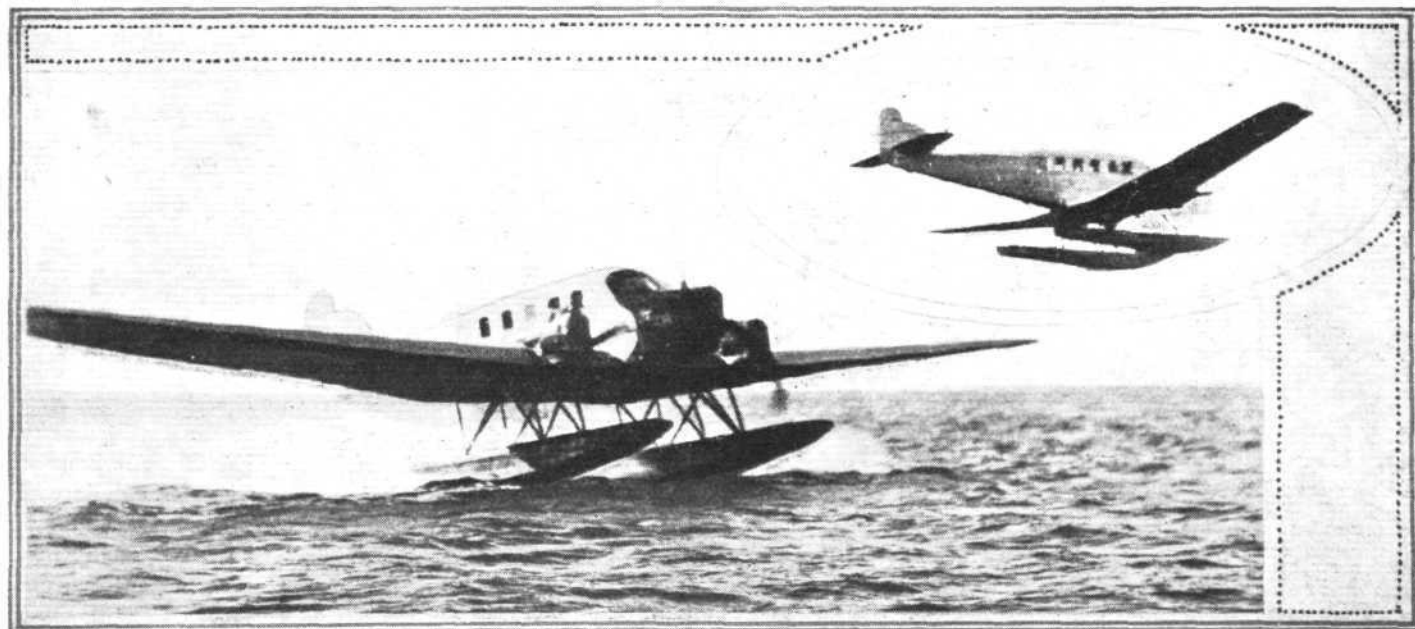


**THE JUNKERS G.24.L :** The view on the right shows the three Junkers L.2 engines and their housing. The top cover of the nose is shown raised for inspection of the engine. On the left is a view of the tail. Note the large horn balance of the elevator, and the negatively cambered tail plane.

The view from these cockpits should be particularly good, and should not be restricted in any direction that matters greatly. Placed as they are, almost on a level with the pilots, the two wing engines can be constantly kept in view.

In proportion to the wing span the distance from the centre line of the fuselage to the centre line of the wing engine is relatively small, and probably therefore, the turning moment

are provided, with ample leg room, so that even lengthy journeys should not be unduly fatiguing. Aft of the cabin is the usual lavatory accommodation, while behind that again is a space for luggage. It is often argued against the three-engined machine that, although, it may provide freedom from forced landings, it will not be very economical. In the Junkers G.24, the power expenditure per passenger is approximately



**IN YET ANOTHER GUISE :** The new Junkers G.23.W three-engined monoplane is produced as a land aeroplane with a variety of engines, according to whether it is to be used in restricted German air services or in other countries. It has now been successfully tested as a seaplane also, and is stated to get off very quickly. The machine here shown was built in Limhamn in Sweden under licence, and in one flight no less than 18 persons were carried. Like all other Junkers machines the G.23.W is of all-duralumin construction.

produced when one wing engine is stopped, is not so great as to interfere seriously with the directional control of the machine. It is stated, that the machine is able to fly level or even to climb slightly with any two engines running, either the two wing engines, or a wing engine and the central engine,

70 b.h.p., which is certainly rather a high figure, but it is now beginning to be realised that it is a little unfair to judge a machine on this basis, since a good power reserve is, of course, a decided advantage, and is even a necessity in order to enable the machine to get off and climb at a safe rate. Moreover,

by flying normally at cruising speed with the engines throttled down, a very considerable increase in reliability is obtained, and probably the fairest basis on which to judge a commercial aeroplane would be to take the power expenditure at cruising speed per passenger carried. We have no actual figures relating to the power taken from the engines of the Junkers G.24 at cruising speed, but a rough estimate indicates that it is probably in the neighbourhood of 500 h.p., when the power expenditure becomes, roughly, 50 h.p. per passenger.

The main dimensions of the Junkers G.24.L. are: Length, o.a., 15.3 m. (50 ft. 0 ins.); height, 5.4 m. (17 ft. 8 ins.); wing span, 20.85 m. (93 ft. 5 ins.); wing area, 89 sq. m. (958 sq. ft.). The weight of the machine empty is 3,600 kgs. (7,925 lbs.), and the useful load is 2,400 kgs. (5,280 lbs.), giving a total loaded weight of 6,000 kgs. (13,205 lbs.). The wing loading is high, i.e., 13.8 lbs./sq. ft., and the power loading, on a basis of normal power of 230 h.p., for each engine (i.e., 690 h.p. in all) is 19.15 lbs./h.p.

The top speed of the Junkers G. 24.L. is 175 km./h., (109 m.p.h.), and at 6,600 ft., the top speed is 100 m.p.h. The cruising speed is 150 km./h. (95.3 m.p.h.), and the landing speed for a total loaded weight of 13,205 lbs., is 105 km./h. (65.5 m.p.h.). At cruising speed the standard petrol tanks contain sufficient fuel for nine hours flying, and the petrol

consumption at cruising speed is stated to be approximately 40 kg./h. (88 lbs./h.), for each engine, or a total of 264 lbs./h.

With full load the machine gets off in 22 seconds, taking a run of 220 metres; the climb to 1,000 metres (3,300 ft.) occupies 8 minutes, and to 3,000 metres (10,000 ft.), 40 minutes.

With full load, the ceiling is approximately 3,800 metres (12,500 ft.).

## The Junkers L.2 engine

As it is not widely known in this country, a few brief particulars of the Junkers L.2. engine may be of interest. This engine is of the six-cylinder in-line water-cooled type, which has always been so popular in Germany. The engine is not unlike the familiar Mercedes, and has an overhead camshaft of very similar type. There are but two valves per cylinder, and the overhead camshaft is driven by a vertical shaft at the back of the engine. The cylinder bore is 150 mm., and the stroke, 180 mm., and the compression ratio is 6.03 to 1. The L.2. engine develops 230 h.p. at 1,420 r.p.m., but is only rated at 195 h.p. The engine weight, (without propeller hub, air screw, water and exhaust pipes), is 290 kgs. (638 lbs.).

The dimensions of the Junkers' L.2. engine are: length (not including propeller hub), 15.80 mm. (63 ins.); height, 10.35 mm. (41½ ins.); width, 5.55 mm. (22¼ ins.).

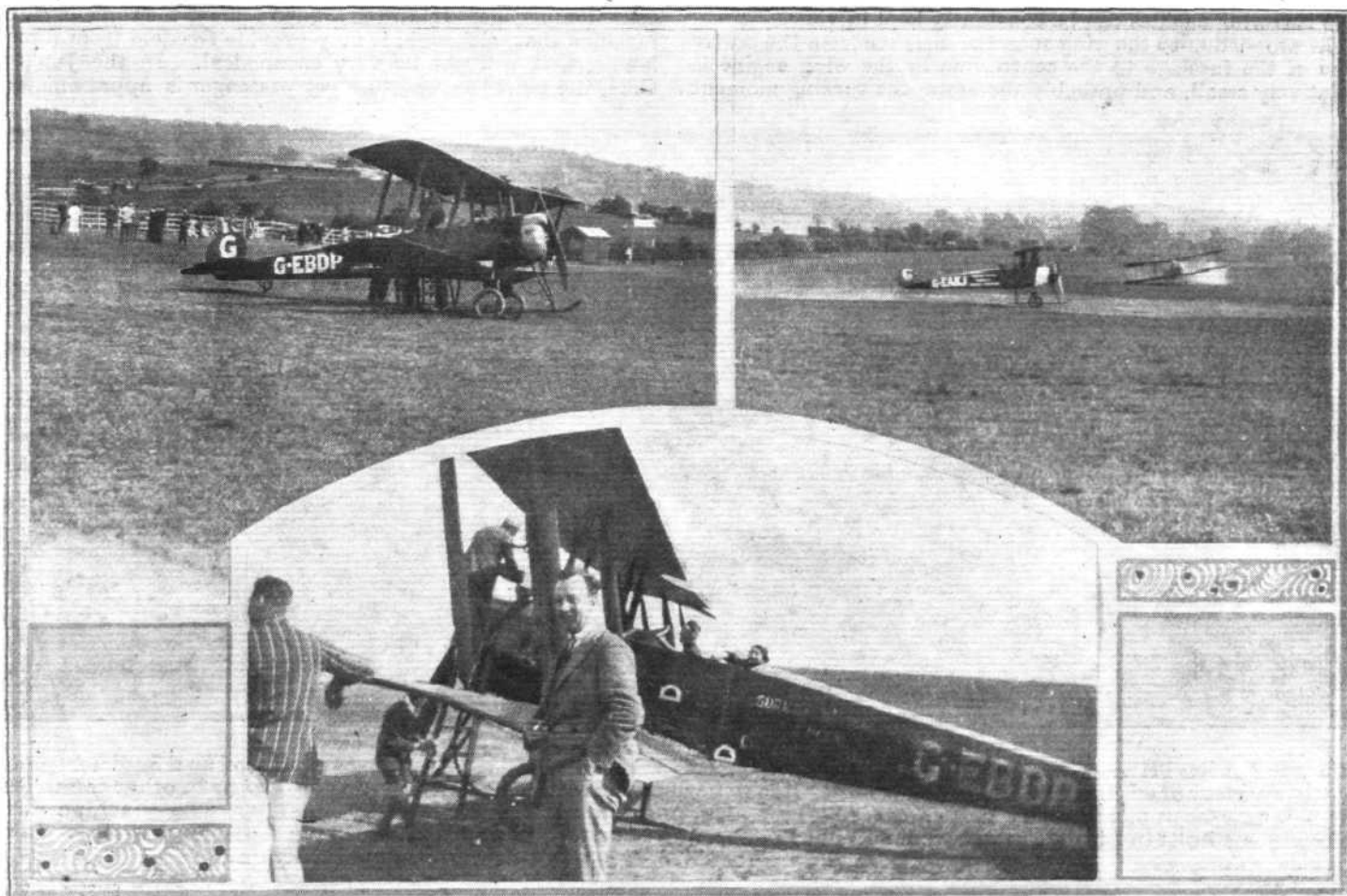
## New World's Speed Record

A NEW world's speed record over 1,000 km. (621.5 miles) was established at Istres (Marseilles) on August 29 by the famous French racing pilot Lasne, who, flying a Nieuport-Delage sesquiplan, fitted with 450 h.p. Hispano-Suiza engine, covered the 1,000 km. course at an average speed of 248.57 km./h. (154.49 m.p.h.). Lasne flew over the famous Villesauvage-La Marmogne course, which is one of 50 km., or 100 km. for the out and home journey. Lasne, who had been obliged to abandon a previous attempt owing to a leak in a petrol tank, thus had to make 10 circuits, and his times were as follows:—

Circuit No.	Time. h. m. s.
1 .. .. .	0 26 54.4
2 .. .. .	0 23 50.8

Circuit No.	Time. h. m. s.
3 .. .. .	0 23 58.4
4 .. .. .	0 24 00.6
5 .. .. .	0 23 57.0
6 .. .. .	0 23 57.8
7 .. .. .	0 23 57.8
8 .. .. .	0 23 49.4
9 .. .. .	0 23 46.0
10 .. .. .	0 24 25.6
Total time .. .. .	4 01 38.8

The previous world's speed record over 1,000 km. was held by Doret on a Dewoitine monoplane, with 300 h.p. Hispano-Suiza engine, whose average speed was 221.775 km./h. (137.83 m.p.h.).



**JOY FLIPS IN THE COUNTRY:** For some time past the Surrey Flying Services have been giving exhibition and passenger flights near various provincial towns. Above we show three views taken at Grove Park, Kent, where Capt. Muir recently had a couple of Avro 504 K's hard at work. Besides "stunt" flying, including parachute jumps and "wing walking," many passengers were taken up for 3-minute flights at 5s. a head. Capt. Muir can be seen standing in front of the machine in the lower photograph.

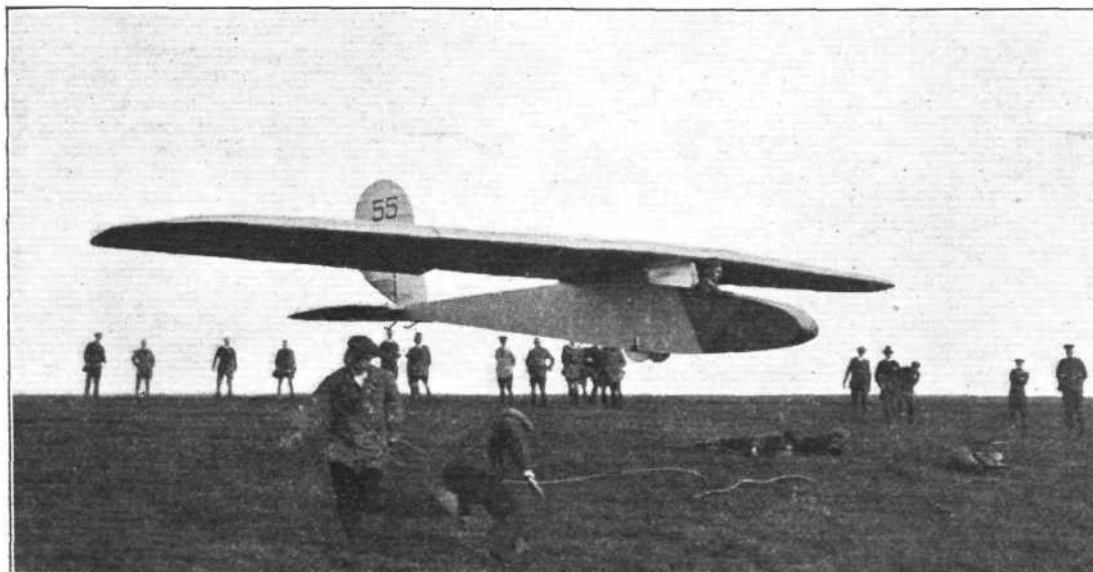
## LIGHT 'PLANE AND GLIDER NOTES

In connection with our Editorial comment on "Amateur Flying" in last week's issue of FLIGHT, we have received a number of communications which appear to indicate that a good many besides ourselves view with some apprehension the future of the light 'plane clubs under present conditions.

ONE correspondent writes on this subject as follows:—  
“I was very interested in your leading article last week, pointing out the difficulties the Light Aeroplane Clubs are

existence, and if there are, it seems extremely doubtful whether, after all these years, they are in a condition to be used with safety, even for straights, without very thorough overhauling.

What seems to be really wanted is for some firm to set to work with a view to producing a really cheap school 'bus, designed specially for the initial stages of training. Such machines need not be very efficient, nor is it absolutely essential that



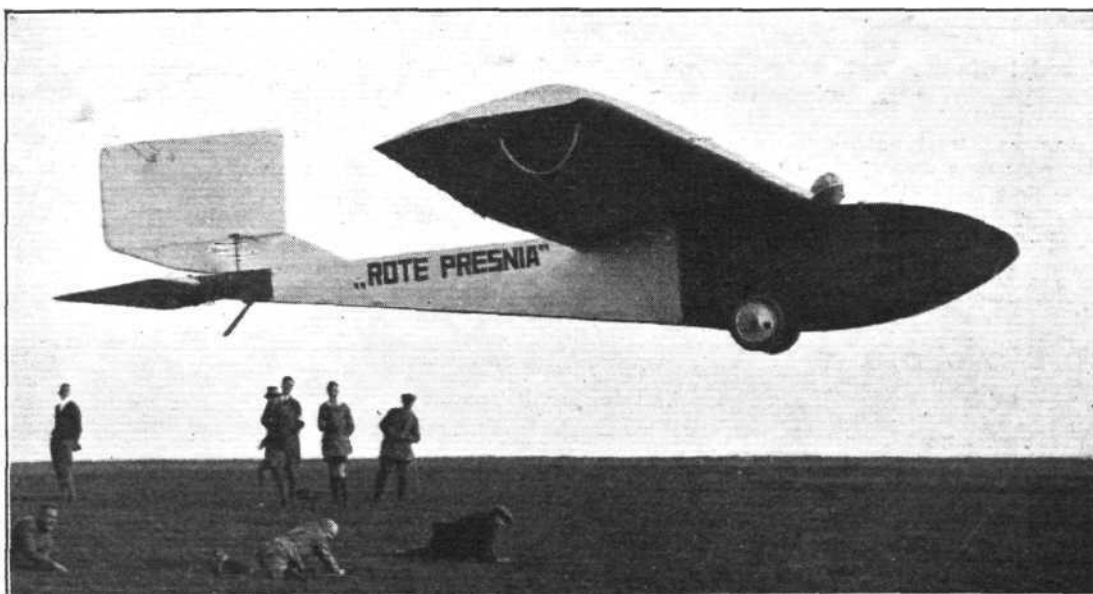
In the Rhön:  
The Russian  
glider "Mos-  
cow" taking off.

likely to have if they have crashes in giving instruction, with their limited cash and few machines. I venture to suggest the following solution to the problem : if these clubs would endeavour to acquire some old Caudron biplanes with 25 or 35 h.p. Anzani engines, and give preliminary instruction on these, given any decent-sized aerodrome, straights could be done, *i.e.*, landing at each end, flying at about 35 ft. high. I know that this form of instruction has its opponents, but, anyway, it gives a certain amount of confidence to the novice before he has to do his first solo in a real machine, and I feel sure that the cost eventually, would be much less, as crashes are almost certain to occur in the first few hours' instruction. In my scheme there would be little chance of serious accidents to the pupils, and if there were, the damage expenses would be

the reliability of their engines should be on a par with that of the A.D.C. "Cirrus." We are quite sure that it is possible to design such a machine, but the main condition for success is that our aircraft constructors be given an entirely free hand, and that the Air Ministry should refrain from interfering in any way, and ought, for this purpose, to waive the usual demands, and not insist upon the standard of excellence required, as our correspondent expresses it, "in a real machine."

THE Rhön glider meeting in Germany is now in full swing, but so far with the exception of a glide of  $13\frac{1}{2}$  miles, it does not appear that any startling performances have been put up. On the other hand, a vast amount of flying is being

In the Rhön:  
Added interest is  
lent to this  
year's Rhön  
meeting by the  
fact that several  
Russian gliders  
are taking part.  
The one here  
shown is known  
as the "Rote  
Presnja"



much less. I imagine the price of such Caudrons would be about £50, if there are any available."

THE suggestion is, we think, a very excellent one, but the "snag" will probably be found to occur in the last sentence of the letter: "if there are any available." Caudron biplanes were, of course, used very extensively, and very successfully, for school work before and during the war, but certainly no machines of this type have been built during the last six or seven years. We, therefore, doubt whether any are still in

done, and by a much larger number of pilots than in previous years, so that what is lacking in "star" performances is being made up for by the spreading of the interest to wider circles. A feature of this year's Rhön meeting is the presence, for the first time, of representatives of Soviet Russia. The pilots and machines took part in last year's Russian glider meeting, and some of them have put up very good performances in the Rhön this year. Two of the Russian machines are shown in the accompanying photographs, and are, it will be seen, of fairly normal design.

# THE PIERO MAGNI "VITTORIA 1924" SESQUIPLANE

## A Novel Italian Sport 'Plane.

WE give this week some particulars and illustrations of an extremely novel type of "sport plane" designed by Sig. Piero Magni, of Italy. This machine was constructed in Sig. Magni's

private enterprise. The original models are shown in the accompanying illustrations.

Fundamentally, the "Vittoria" is a "sesquiplano a

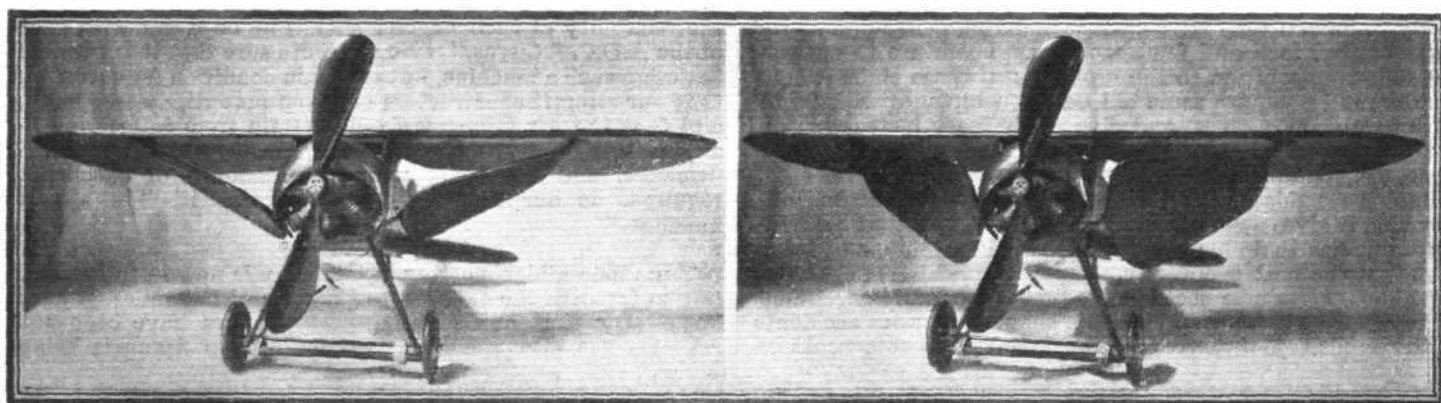


○ ○ ○ ○ ○ ○ ○ ○ ○ ○  
The Piero Magni  
"Vittoria 1924"  
Sesquiplane: About  
to start on its first  
flight (October 22,  
1924), piloted by  
its designer. This  
machine is fitted  
with a 50 h.p.  
Anzani 6-A.20, and  
has movable aux-  
iliary planes form-  
ing the main wing  
struts.  
○ ○ ○ ○ ○ ○ ○ ○ ○ ○

own factory, the "Laboratorio Costruzioni Aeronautiche Pietro Magni," at Meda, near Milan, which was founded in 1921 and where a considerable amount of experimental and constructional work has been carried out.

The "Vittoria 1924"—named after the designer's sister—was produced primarily for the designer's private use as a

*triangolo a finezza variabili*—or, in other words it is a dorsal-wing, single-strut, semi-cantilever monoplane in which inclined struts supporting the wings from the fuselage also form small auxiliary wings which contribute a certain amount of lift. While the wing structure is of the "thin-wing" type, it is nevertheless "wireless." The most original feature of



A model of the first, 1919-a, type "Vittoria" sport 'plane (50 h.p. Gnome), showing (left) the auxiliary wings in normal flying position, and (right) in air-brake position.

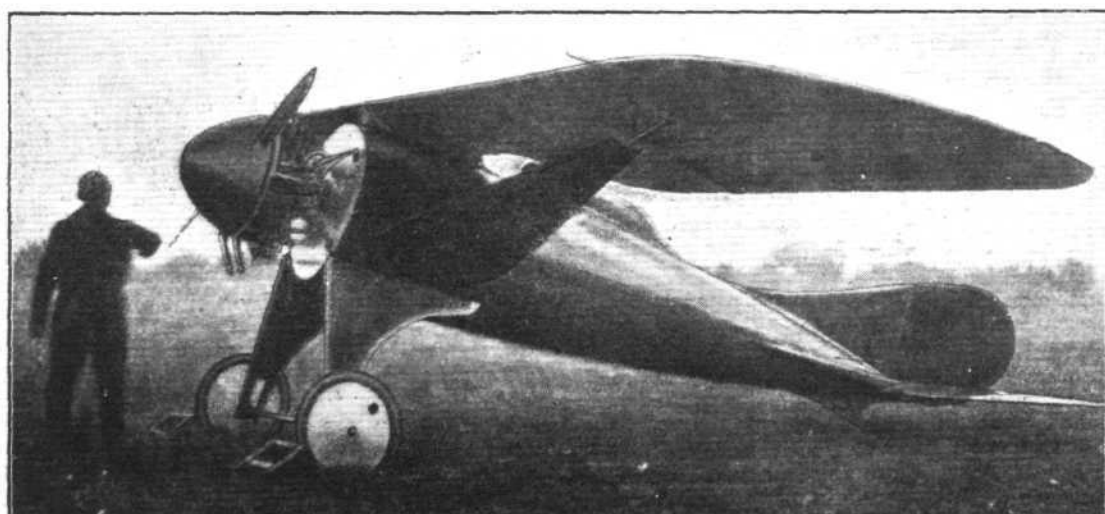
touring and "laboratory" machine, and, as will be seen later, possesses several interesting and original features.

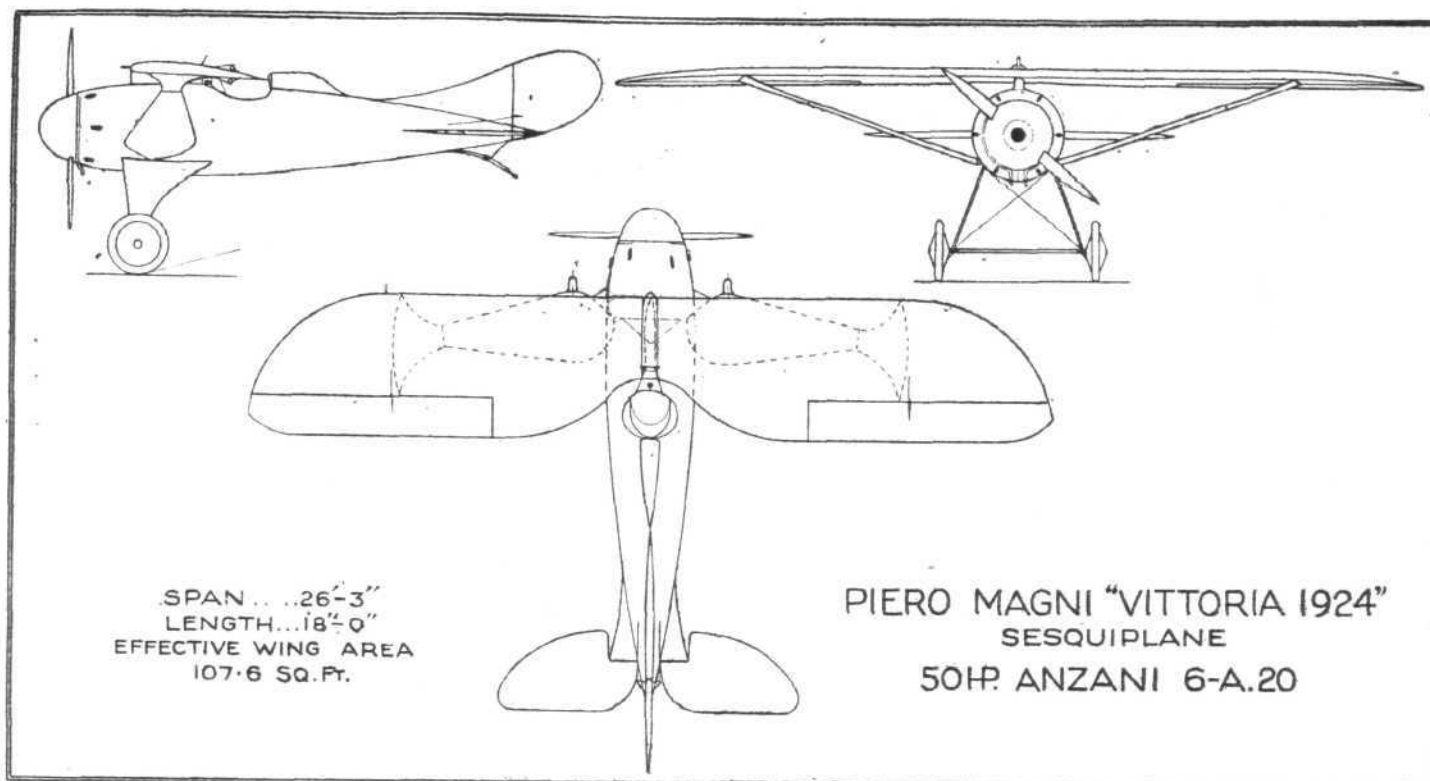
The first conception of this machine dates back to 1919, when scale models on the same principle, designed round a pre-war 50-h.p. Gnome engine, were exhibited in the Italian section of the Paris Salon of that year, while models were also tested in the Eiffel Auteuil Laboratory, when it was a

the machine however lies in the fact that the auxiliary wings are movable, i.e., their angle of incidence may be varied during flight from the pilot's cockpit, either simultaneously or independently. Thus, by setting simultaneously the two auxiliary wings at a large angle, a powerful air brake is obtained.

Again, any variations in the angle of incidence of these

○ ○ ○ ○ ○ ○ ○ ○ ○ ○  
○ The Piero Magni  
"Vittoria 1924"  
Sesquiplane:  
Another view,  
showing the  
cowling removed  
from the Anzani  
engine; the  
covering over the  
main wing at-  
tachment of the  
auxiliary wing  
strut is also  
removed.  
○ ○ ○ ○ ○ ○ ○ ○ ○ ○





THE PIERO MAGNI "VITTORIA 1924" SESQUIPLANE: General arrangement drawings.

planes give, it is claimed, much the same conditions as those obtaining with variable camber systems, thereby facilitating landing in restricted areas. The control of these auxiliary planes, it should be noted, is quite independent of the usual control of the machine, although the two controls may be partially interconnected for special purposes. We understand that this system of control, as first devised by Sig. Magni, was the first of its kind, although a machine embodying a similar idea was produced in America after the design of the first Piero Magni machine.

Another important feature of the "Vittoria" consists of the improved range of vision its design offers. As will be seen, the main plane being level with the pilot's eyes, the maximum range forward and above is obtained as in the high-wing type monoplane, while the position and small size of the auxiliary planes does not restrict the vision downwards to any considerable extent.

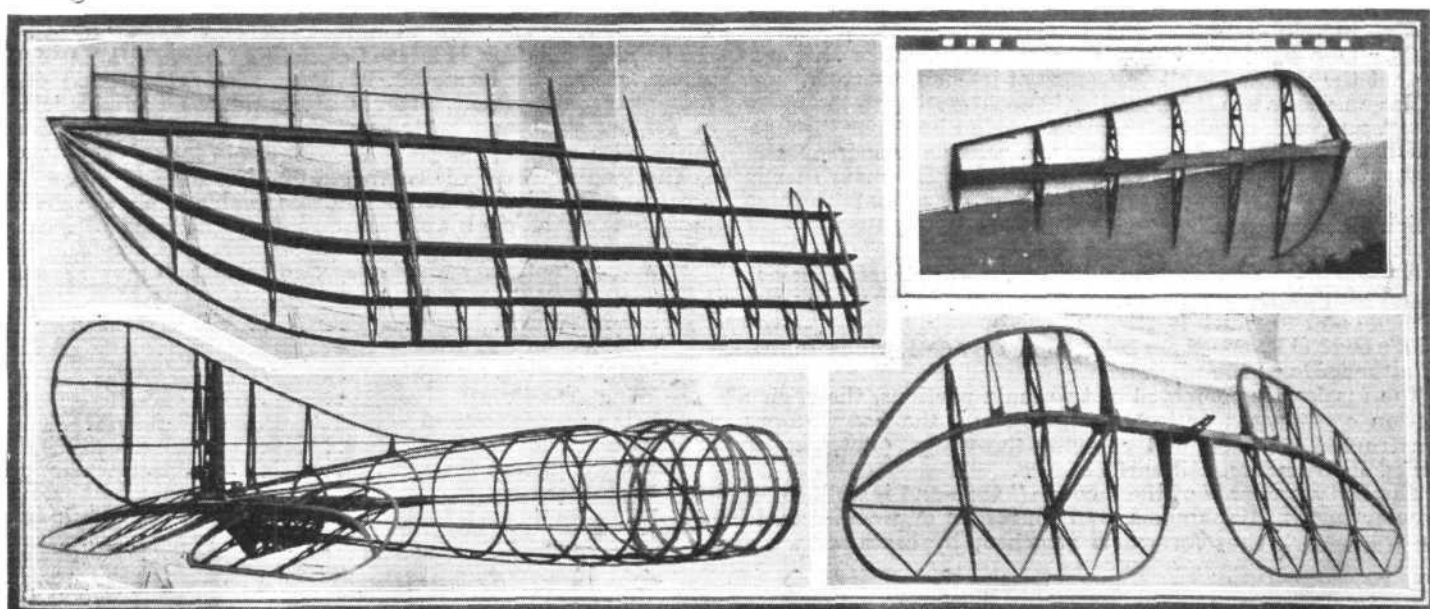
A second experimental machine, "Vittoria 1925"—also for Sig. Magni's private use—is now nearing completion, but it differs from the "1924" in details only. There is also a commercial production model of the "Vittoria" which will be placed on the market in a few weeks. Sig.

Magni is also developing new commercial and military machines on similar lines, especially as regards deck-landing ships' planes, while designs are being prepared of machines embodying new devices, such as variable camber wings, etc.

Now as to some particulars regarding the construction of "Vittoria 1924." The main plane is entirely of wood construction, consisting of a framework of longerons and ribs built up in the form of a box, the covering being of plywood. There are five longerons, of which the first and fifth are auxiliary. As will be seen from one of the accompanying illustrations the spars run parallel from the fuselage attachment up to the wing-strut attachment. Thence they curve back, converging together at the extreme wing tip.

The thin main longerons are divided into one primary (the third) and two secondary (the second and fourth); they are built up of two spruce strips separated by a triangulated lattice of battens of the same material, the whole being boxed in by plywood. The ribs are of similar construction. The wing section employed is known as "P.M. 14."

The ailerons for lateral balance are mounted on the rear



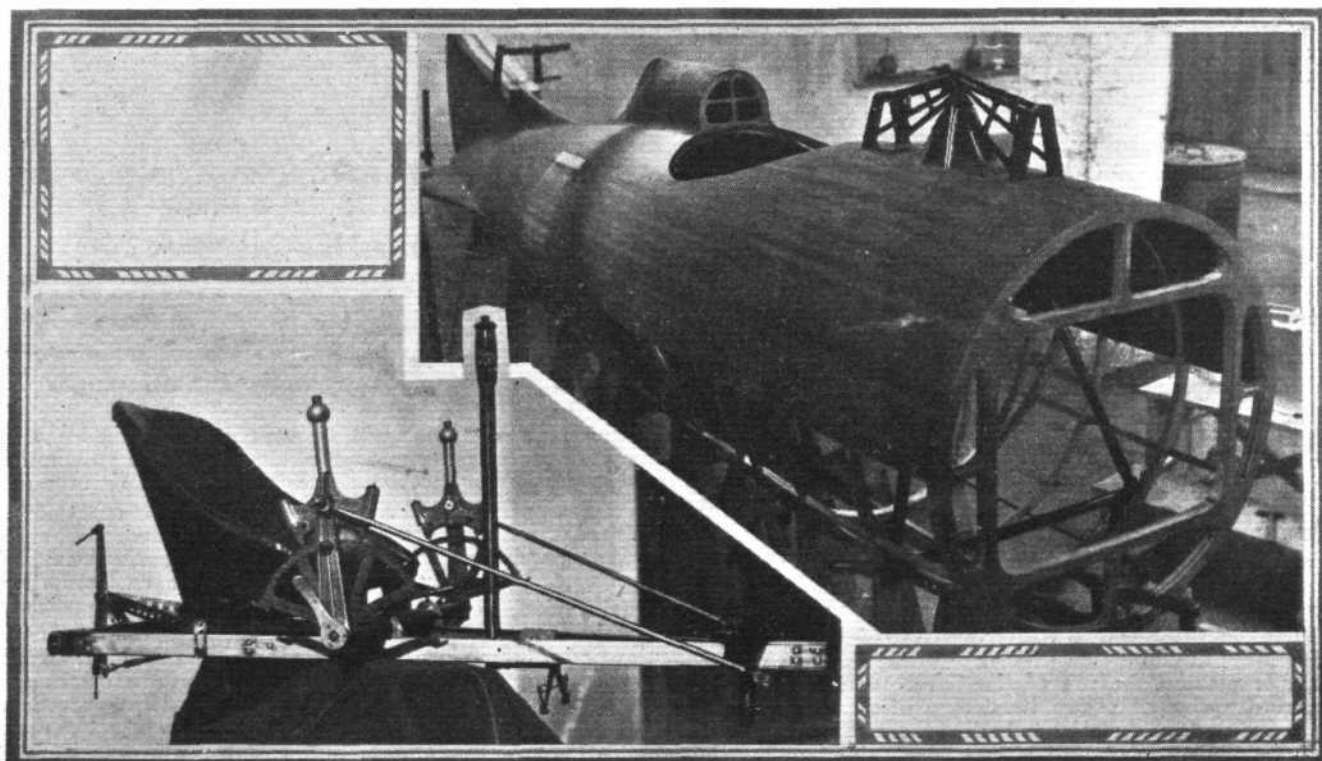
THE PIERO MAGNI "VITTORIA 1924" SESQUIPLANE: Some constructional details. On the left (top) the main starboard wing in skeleton, and below the fuselage frame, which is covered with plywood. On the right will be seen one of the auxiliary wings (top) and the tail plane, or elevator.

spar of the main wing, and are of similar construction. For lateral control they are interconnected, but are independent of the auxiliary wings. Each aileron is provided with two steel operating levers, faired by plywood. The control cables, also doubled, pass through the wings and the fin-like cabane supporting the wings on the fuselage. Inspection doors are provided for the cables and pulleys.

The main wings, which are in two portions, are attached to a fin-like cabane projecting from the fuselage by means of three detachable metal fittings, corresponding to the three main longerons of the wings. The attachment at the central, or primary, longeron is of the articulated spherical type, while the two other attachments are of the fork type, adjustable as to height and thus allowing the wings to be set at any desired angle of incidence. It is of interest to note that the central attachment on the cabane is formed

covering of special plywood. At the rear of, and built integral with, the fuselage are the fixed tail surfaces, comprising a vertical fin, to which is hinged the rudder, and two small triangular horizontal surfaces (one each side of the fuselage) carrying the comparatively large one-piece balanced elevator.

The forward or engine section of the fuselage is constructed of metal and forms a self-contained unit entirely separate from the fuselage, from which it is divided by a fireproof partition. This engine section can easily be detached, enabling, if necessary, another unit with similar or different type of engine to be as easily substituted. The engine fitted is an Anzani 50 h.p. type 6A.20 air-cooled radial, but we understand that a rotary engine such as the 50 h.p. Gnome can be fitted. The engine is mounted in a metal frame attached to the fuselage by four detachable fittings in such a way that



**THE PIERO MAGNI "VITTORIA 1924" SESQUIPLANE:** At the top is a view of the partly-covered fuselage, showing the triangular steel frame support for the main planes. Below is the pilot's control, the two side levers operating the auxiliary wings.

on a triangular transverse member of the fuselage, of metal tubes, to the bottom of which are attached the main wing struts (which also carry the auxiliary wings). All wing loads are thus centred on this transverse triangular metal frame, thereby relieving the fuselage of any heavy wing loads. Of course, all wing joints or attachments are designed so that they allow for all variations of incidence setting.

The auxiliary wings are similar in construction to the main wings, and each consists of a main wooden box spar through which passes the main wing strut, a secondary spar at the rear, spruce ribs, and a plywood covering. The main spar is mounted on the wing strut by means of special bearings which allow the auxiliary wing to rotate through a range of incidence between  $-3^{\circ}$  to  $90^{\circ}$ .

At the lower end of each auxiliary wing is a steel crank lever, faired with wood, working in a recess formed in the side of the fuselage and to which is attached the operating rod from the pilot's control lever—there being a lever for each wing situated on either side of the pilot.

The fuselage is composed of two main portions, the engine section constructed entirely of metal, and the body proper constructed of wood and carrying the wings, pilot, chassis tanks, instruments, tail surfaces, etc.

The body proper is of the "coque" type and is built up of circular hoops, diaphragms, and longerons of wood, and to the framework thus formed is attached, by brass screws, a

the whole engine unit can pivot on two of these fittings and swing clear of the fuselage, thus greatly facilitating repairs, inspection, etc. A quickly detachable aluminium cowl encloses the engine, and forming a continuation of the cowl is a spinner, also of aluminium, mounted on the airscrew.

The pilot's cockpit is located at the rear of the main wings where, as previously stated, he has a remarkably good all-round range of vision. In front of the pilot is a wind shield, of Triplex glass, and behind is a fairing for his head. This fairing also contains the parachute, for use in case of accidents.

The landing chassis is composed of two faired inverted L-struts carrying two large-diameter Palmer aero wheels mounted on a steel axle, sprung by "Sandow" shock absorbers.

The principal characteristics, for normal flying, of the "Vittoria 1924" are:—

Span .. .. .	26 ft. 3 ins.
O.A. length .. .. .	18 ft.
Height .. .. .	7 ft. 4 ins.
Wing area (total) .. .. .	118 sq. ft.
Wing area (effective) .. .. .	107.6 sq. ft.
Weight (empty) .. .. .	623 lbs.
Weight (laden) .. .. .	905 lbs.
Useful load .. .. .	282 lbs.
Wing loading .. .. .	8.4 lbs./sq. ft.
Power loading .. .. .	17.08 lbs./h.p.

#### R.A.F. Flying Accident

THE Air Ministry regrets to announce that, as a result of a collision in the air at Hinxton, Cambridge, between two Siskin machines of No. 111 Squadron, Duxford, on August 28,

Flying Officer Harry Butlin, the pilot of one machine, and his passenger, Pilot Officer Dermot de Robeck, were killed. Pilot Officer Hugh Peck, the pilot and sole occupant of the other machine, was also killed.

# Personals

## Married

At Christ Church, Lanark, on August 25, the marriage took place between Flying Officer IAN A. BERTRAM, R.A.F. (late R.N.), and DOROTHY CECIL, only daughter of Colonel and Mrs. R. H. ELIOTT-LOCKHART, of Cleghorn, Lanark.

Dr. SIDNEY RICHARD ECCLES DAVIES (late Capt., R.A.F.), B.A. Cantab., D.P.H., Lond., elder son of Sidney Davies, M.D. Oxon, and Mrs. Davies, Cove Hithe, Worthing, was married on August 5, at Keady Parish Church, to DOROTHY CHARLOTTE HOBART, B.A., M.B., D.P.H., second daughter of H. Hobart Dorman, M.D., and Mrs. Dorman, Willowbank, Keady, County Armagh.

The marriage of Flying Officer R. M. DAVY, elder son of the late Samuel H. M. Davy and of Mrs. Austin Batty, of Sheffield, and Miss DOROTHY STEWART, youngest daughter of the late Mr. and Mrs. A. M. Stewart, Hotel Russell, W.C., took place quietly in London on August 27.

THOMAS JOHN KENT (late R.A.F.), eldest son of the late Prof. Kent, F.R.C.S., and Mrs. Kent, of Uptons, Framfield, Sussex, was married on August 25, at All Saints, Kenley, to AGNES MARIA FAIRLIE STIRLING, eldest daughter of Mr. and Mrs. D. E. Stirling, of Highfield, Kenley, Surrey.

The marriage took place on August 12, at All Saints' Church, Brenchley, Kent, of Flying Officer ROBERT DARLEY WHELAN,

R.A.F., eldest son of the Rev. P. S. Whelan and Mrs. Whelan, of Brenchley Vicarage, and Miss BARBARA MARION CELIA WREY, younger daughter of Sir Bouchier and Lady Wrey, of Tawdsen, Brenchley. Bishop Beaven, late Bishop of Southern Rhodesia, and the Rev. P. S. Whelan officiated. The best man was Flight-Lieutenant S. L. G. Pope, R.A.F.

Flight-Lieut. CHARLES HENRY CHAPMAN WOOLLVEN, R.A.F., son of Mr. and Mrs. William Charles Woollven, of Jersey and Plymouth, was married on August 6 at Holy Trinity, Paddington, to ARIEL GWYNNEDE ALICE JEFFERY, daughter of the late Mrs. A. H. Jeffery, 68, Pattison Road, Childs Hill, N.W.2, and Casita, Angmering-on-Sea, Sussex.

## To be Married

The engagement is announced between Air Vice-Marshal ROBERT BROOKE-POPHAM, C.B., C.M.G., D.S.O., A.F.C., Commandant of the Royal Air Force Staff College, and OPAL, younger daughter of Mr. and the late Mrs. EDGAR HUGONIN, and niece of Sir Granville Wheler, Bt., and Lady Wheler, of Ledston Hall, Yorkshire, and Otterden Place, Kent.

The engagement is announced between Flight-Lieut. ROBERT BRUCE SUTHERLAND, D.F.C., R.A.F., eldest son of Mr. Donald Sutherland, M.P., and Mrs. Sutherland, of Ingersoll, Ontario, and Miss EILEEN DE MAIRIS, only daughter of Mr. and Mrs. Charles RUSH, of Bedford.

## AMERICAN AVIATION MEETINGS

BESIDES the seaplane race for the Schneider Cup, which takes place at Baltimore between October 24 and 29, several big aviation events have been organised in America for the immediate future. Of these perhaps the most important is the "National Aviation Meet," which includes the race for the Pulitzer Trophy, fixed for September 27 to October 7. This year—for this is an annual event—the meeting is being held at Mitchel Field, Long Island, N.Y., under the New York Chapter, National Aeronautic Association of U.S.A. It is stated that several modifications in the arrangements have been introduced this year, the aim of which is to render the events popular and interesting to the public, and at the same time to encourage both branches—military and civil—of aeronautics.

From September 27 to October 7 the "On to New York" contest, for the New York Chapter N.A.A. Trophy, will take place, a popular event in which civilian machines have to fly to New York from various outlying towns and are awarded marks for distance flown, passengers carried, speed, etc. The prizes for this event amount to \$3,000. From October 8 to 10 the main events take place. These are as follows:—October 8.—(1) Free-for-all race for two-seater low-powered machines (civilian). Prizes, \$2,500. (2) Free-for-all race for two-, three- or four-seater machines (civilian). Prizes, \$2,500.

(3) Race for two-seater observation type machines (military) for the Liberty Engine Builders' Trophy and \$2,500. October 9.—(4) Duration race for models for Mulvihill Trophy and \$500. (5) Light commercial speed and efficiency race for Aviation Town and Country Club of Detroit Trophy and \$2,500 (civilian). (6) Light aeroplane contest for *Dayton Daily News* Trophy and \$2,000 (civilian). (7) Race for large capacity machines (military) for *Detroit News* Air Transport Trophy and \$2,000. October 10.—(8) Speed and efficiency race for light aeroplanes (civilian) for *Scientific American* Trophy and \$2,000. (9) Race for Pursuit type machine (1st Pursuit Group) for John L. Mitchell Trophy. (10) High-speed race (civilian and military) for Pulitzer Trophy and \$4,000.

Another interesting air contest will be held on September 28. This is the "First Inter-City Commercial Airplane Tour" for the "Ford Trophy," held under the auspices of the Detroit Aviation Society. Entries are limited to manufacturers only, for 'planes capable of a speed of 80 m.p.h. and carrying a commercial load of passengers or equivalent cargo. The tour starts from Dearborn Airport, Detroit, and includes the following route:—Fort Wayne, Chicago, Iowa City, Omaha, St. Joseph, Kansas City, St. Louis, Indianapolis, Dayton, Columbus, Cleveland, Toledo, and Detroit.

## Aerial Progress in South America

COMMERCIAL aviation is slowly but surely making headway in South America. The "Scadta" firm in Colombia, for instance, which has been operating certain air lines in that country during the past two or three years, recently inaugurated its first international service, between Barranquilla and Maracaibo (Venezuela), in conjunction with the newly-formed Condor Syndicate. The latter is formed by German, Austrian and American interests, and the machines used are twin-engined seaplanes built by the Dornier-Wal factory in Italy. The Condor company is also establishing a service between Curazao and the Panama Canal, via Puerto Colombia, which later will be extended through Central America to Key West, Fla. "Scadta" is to receive a subsidy from the Colombian Government, which will enable it to increase its fleet and reduce fares.

## James Watt's Workshop

ALTHOUGH not directly connected with aviation, we think many of our readers will be interested to know of the latest addition to the many historic items to be seen at the Science

Museum, South Kensington. This consists of a reproduction of the private workshop wherein James Watt—one of the world's greatest engineers—spent much of his time. The workshop was in a garret in Watt's residence at Heathfield, Birmingham, which he built in 1790, and lived in till his death in 1829. By his son's direction, the garret was then shut up and remained so up till last year, when the estate having been sold and the house being about to be pulled down, the contents of the workshop were presented to the Museum by Major J. M. Gibson Watt, the head of the family. Sufficient structural details from the old house to reproduce the room have been presented by Mr. J. C. Hudson and Mr. A. Round. Among a most heterogeneous collection of tools and machinery, perhaps the most interesting objects are two sculpture machines for making copies of busts, &c. To these machines Watt devoted most of his spare time. Many objects of personal interest are to be seen; his eye piece, his leather apron, his frying-pan and dutch-oven, with which he cooked his food when he did not wish to be disturbed; a melancholy interest attaches to a trunk on the floor containing school books of Gregory Watt, his son, who died in early manhood of consumption.

# AERONAUTICAL RESEARCH COMMITTEE REPORTS

FROM the number of enquiries we receive it appears that there is a desire in aircraft circles to know approximately the contents of the various technical publications of the Aeronautical Research Committee. All the aircraft firms probably receive these reports regularly, whether or not they contain anything of immediate interest or utility. In the case of draughtsmen, however, and others interested in aeronautics, who can hardly be expected to purchase all the reports, the problem of deciding whether any publication interests him is often a difficult one. As it is obviously desirable that the knowledge of aeronautics should be made available to all who take an interest in the subject, we have arranged with the Air Ministry to publish in *FLIGHT* summaries of all the technical publications as soon as these are issued, or shortly before they are published. All A.R.C. publications can be purchased from H.M. Stationery Offices at Adastral House, Kingsway, London, W.C.2; 28, Abingdon Street, London, S.W.1; York Street, Manchester; 1, St. Andrew's Crescent, Cardiff; 120, George Street, Edinburgh, and through any bookseller.

**The Effect of Keyways upon the Strength and Stiffness of Shafts subjected to Torsional Stresses.** By H. J. Gough, M.B.E., B.Sc. R. & M. No. 864. 20 pages and 6 diagrams. April, 1925. Price 1s. 3d. net.

Keyways are extensively used in engineering practice, and their effect on the strength and stiffness of a shaft is important. A previous paper on this subject by Dr. A. A. Griffith has been published in the Reports & Memoranda Series (R. & M. No. 334, "Determination of the torsional stiffness and strength of cylindrical bars of any shape.") The main object of the present enquiry was to determine the relative limiting ranges of torque under reversals of load for a solid shaft, a shaft with a standard keyway, and a shaft with a keyway of equal depth and half the width of a standard keyway. The limiting ranges of torque were determined by endurance tests.

Two materials were employed in the tests, Armco Iron—as representing materials of great ductility, and 0.65 per cent. C. steel, as typical of harder metals.

Endurance tests were also made upon a keyed drive in which the torque was transmitted through a shaft, *via* a key, to a keyed member.

The elastic stiffness and strength of each type of shaft under static torsional straining have also been determined. These results have been compared with those calculated from empirical formulæ derived from soap-film experiments by Dr. A. A. Griffith (R. & M. 334).

Under reversed torsional stresses the limiting ranges of torque for shafts with full width and half-width keyways were identical for any one material. The reduction in strength due to the presence of the keyway amounted to 21 per cent. and 12 per cent. for 0.65 per cent. C. Steel and Armco Iron respectively. In the keyed shafts (of Armco Iron) a total reduction of 33 per cent. was observed.

The effect of the presence of the keyway was to reduce the elastic stiffness by 6 per cent. and 10 per cent., respectively, for shafts containing the narrow and wide keyways. The reduction in elastic strength for each type of keyway had the same value of 23 per cent. Agreement was found in comparing these results with those predicted by the formulæ of Griffith, the maximum divergence being 4.7 per cent.

**A Continuous Rotation Balance for the Measurement of Pitching and Yawing Moments due to Angular Velocity of Roll ( $M_p$  and  $N_p$ ).** By T. Lavender. Reports and Memoranda, No. 936. (Ae. 157.) (3 pages and 2 diagrams). February, 1925.

**Summary.**—For the complete analysis of the stability of an aeroplane a knowledge is required of various so-called rotary derivatives, which are the rates of change of the moments about three mutually perpendicular axes caused by angular motions about these axes. Some of these derivatives for model aeroplanes can be measured in the wind tunnel by oscillation experiments only, but three of them, viz., the rates of change of rolling, pitching, and yawing moment due to an angular velocity of roll ( $L_p$ ,  $M_p$  and  $N_p$ ) can conveniently be determined by causing the model to roll continuously about an axis parallel to the wind direction and measuring the appropriate couple.

In a previous report (R. & M. 828) a description was given of a continuous rotation balance for the measurement of  $L_p$  at small rates of roll; the present report describes the modifications which have been made to this piece of apparatus to enable it to be used for the measurement of  $M_p$  and  $N_p$  as well. The apparatus has proved satisfactory, the general order of accuracy of the measurements being found to be at least as great as, and probably greater than, that usually obtained in experiments involving measurements of pitching and yawing moments on a stationary model.

**Reports and Memoranda of the Aeronautical Research Committee Published between April 1, 1923, and December 31, 1924.** Reports and Memoranda, No. 950. April, 1925.

**Summary.**—It has been customary in the Reports of this series to make every hundredth report (starting from R. & M. 650) take the form of an index. In accordance with this practice, the present R. & M. 950 gives a list of the Reports and Memoranda published by the Aeronautical Research Committee between April 1, 1923, and December 31, 1924.

In the section dealing with the aerodynamic loading, reference is made to a number of reports containing the results of wind tunnel observations on model airships. The Report of the Airship Stressing Panel (R. & M. 800) is taken as the basis for recommendations for strength calculations, with the addition of certain more recent material tabulated in Appendix III of the present report. Attention is drawn to various points which the Panel considered important in the application of the methods of R. & M. 800.

In section (3) is given a schedule of factors of safety for various conditions of loading and aerodynamic trim of the airship.

In section (4) consideration is given to the questions of fire prevention; protection from electrical discharges; the utilisation of about 4 per cent. of the full engine power for moving the ship astern and for controlling the angular movement of the ship at lower speeds; and to the questions of instruments, guy ropes, ballast and the inspection of the material and workmanship.

Three appendices are attached to the report, of which the first contains calculations relative to the effect of deflated gas bags, the second contains a note on the possible gradual deterioration of duralumin, and the third contains a list of papers relating to airships.

**The Measurement of Airflow Round an Airscrew.**

By C. N. H. Lock, M.A., and H. Bateman, B.Sc., D.I.C. R. and M., No. 955. (Ae. 174.) (15 pages and 8 diagrams.) November, 1925. Price 1s. net.

This paper gives the results of observations of airflow near to an airscrew made with the standard N.P.L. type of yawmeter, from which values of the axial, radial and circumferential components of the velocity were deduced on the assumption that the flow was symmetrical about the axis of the airscrew. The experiments were undertaken partly with a view to supplementing some previous work on overall performance of airscrews (see R. and M., No. 892, "Experiments with the Family of Airscrews, Part III," Lock and Bateman), and partly with the object of comparing the velocities of the airscrew with those predicted by the newly advanced vortex theory of airscrews (R. and M., No. 786, "An Aerodynamic Theory of the Airscrew," Glauert). This theory has already been substantially verified on the basis of overall force measurements, but the comparison of the measured axial and circumferential velocities with the interference flow from the vortex theory provides a more critical test of the theory. Fair agreement between observations and the results predicted by the theory was obtained in most cases, and the results may, therefore, be considered as encouraging to the use of measured interference flow for analysing airscrew performance in cases where the vortex theory does not apply.

**Notes on Stalled Flying.** By R. M. Hill and H. L. Stevens, of the Royal Aircraft Establishment. R. and M., No. 963. (Ae. 179.) (9 pages and 1 diagram.) October, 1922. Price 6d. net.

The subject of the control of aeroplanes at and beyond the stall is one that is receiving considerable attention at the present time, and this report is of interest in that it describes full-scale experiments conducted on a standard

Avro and an Avro fitted with a large rudder when flown at large angles of incidence of the order of  $20^\circ$  or  $30^\circ$ . The efficiency of all the controls was tried, various manoeuvres being performed in the air, and there were definite indications that the large rudder was more effective in stalled flight than the small one, but not so much more effective than had at first been hoped. The authors, however, are of the opinion that the large rudder went far towards providing the capacity to damp out oscillations occurring in stalled flight. In the appendix a discussion is given on stalled flight, attention being drawn to the difficulties which present themselves and the requirements to be observed in overcoming these difficulties.

**The Control of a Stalled Aeroplane as Affected by the Use of Differential Ailerons.** By H. L. Stevens, B.A. Presented by the Director of Scientific Research. R. and M., No. 964. (Ae. 180.) (5 pages and 3 diagrams.) November, 1924. Price 6d. net.

It is well known that control at low speeds near the stall is rendered difficult by the fact that in order to be effective the ailerons have to be set at such large angles that serious yawing moments are introduced which the rudder control is often inadequate to meet. Various devices have been tried with the object of obtaining adequate aileron control unaccompanied by these undesirable yawing moments to which the downward moving aileron contributes the major proportion. One method which appeared as if it might have some advantages in practice consisted in fitting the ailerons with a differential movement, allowing the upward moving aileron to be set at much larger angles than the downward moving one. In the present paper full-scale investigation of this method is described.

An Avro aeroplane type 504K was fitted with a differential system of aileron control, allowing very large upward aileron angles. The effect of this control was tried in stalled flight and in spins. Differential ailerons as fitted to the D.H.37 and D.H.51A, the latter with automatic variable camber in addition, were also tested by kind permission of the De Havilland Company.

The Avro could be brought out of a spin by the use of this control alone, the rudder being kept hard on and the stick full back. With the differential system, however, both as fitted to the Avro and to the De Havilland aeroplanes, the aileron yawing moment is not reversed for small control angles, but from experiments carried out on the Avro using large angles it is concluded that a control having this feature would largely reduce the danger of the stalled state.

**Full-scale Tests of Different Ailerons on Bristol Fighter Aeroplane.** By H. M. Garner, M.A., and E. T. Jones, B.Eng. Reports and Memoranda, No. 966. (Ae. 182.) (7 pages and 10 diagrams.) January, 1925.

**Summary.**—The value of any particular form of aileron is determined not only by the magnitude of the rolling moments that can be obtained by its use, but also by the moment about the hinge of the aileron which the pilot has to exert through the medium of his control column in order to set his aileron to give him the desired control. It is important also to know the value of the yawing moment introduced by a given setting of the ailerons. In earlier reports of this series\* tests are described in which measurements of rolling moments, yawing moments, and hinge moments were made on model ailerons of different types. In some of these tests balanced ailerons were used, designed with the object of reducing the hinge moment necessary to produce a given rolling moment, and the results appeared sufficiently promising to justify an attempt to verify them on the full scale.

Such an attempt is the subject of the present paper. Three different types of ailerons, the standard F.2B, the Handley Page balanced and the Bristol "Frise" (also a balanced type), were fitted in turn to a Bristol Fighter aeroplane. The method of experiment was to apply known rolling moments to the machine by means of two tanks of 15 gallons capacity,

\* R. and M. 651. "Investigation of the aerodynamic properties of wing ailerons. Part III."—Irving and Ower.

R. and M. 916. "Slot control on an Avro with standard and balanced ailerons."—Bradfield.

R. and M. 932. "Experiments on a model of a Bristol Fighter (1/10 scale). Section 1. Force and moment measurements at various angles of yaw."—Irving and Batson. Section 2. "Lateral derivatives by the forced oscillation method."—Frazer, Batson and Gadd.

one under each pair of outer struts, which could be filled with water and emptied, if desired, by valves operated from the observer's cockpit. The aeroplane was flown in straight glides with no bank and engine switched off, the applied rolling moment being balanced by means of the ailerons; for each set of ailerons measurements were made of mean aileron angle, mean rudder angle, lateral force exerted by the pilot on the control column, and indicated air speed at angles of incidence of the main planes of about  $2^\circ$ ,  $5^\circ$ , and  $9^\circ$ . From these data it was possible to calculate the rolling moment, yawing moment, and hinge moment coefficients for the three types of ailerons.

The observed differences in rolling and yawing moment coefficients for the three types were very small. The hinge moment coefficient for the Bristol "Frise" was appreciably smaller than that for the balanced Handley Page, although the hinge in the former was further forward, but it is pointed out that the measurements were confined by experimental limitations to aileron angles not exceeding about  $4^\circ$ , so that general conclusions should not be drawn from the results. Attention is also drawn to the practice of rigging machines on the ground with the ailerons set down at a small initial angle (about  $2^\circ$ ) with the wing chord; it appears from some of the experiments that the effect of this procedure on the hinge moment of balanced ailerons of the set-back hinge type may be appreciable, leading in certain circumstances to instability of aileron control at aileron angles of about  $7^\circ$ . Where comparisons were possible, fairly good agreement was obtained between the full-scale and model results.

**Pitching and Yawing Moments with Sideslip on a Model Aeroplane with Zero Stagger.** By the Aerodynamics Staff of the Royal Aircraft Establishment. R. and M. No. 965 (Ae. 181). (14 pages and 15 diagrams.) January 1925. Price 1s. net.

This paper describes tests of pitching and yawing moments over a wide range of angles of yaw made on a model of an aeroplane which proved difficult on the full-scale to pull out of a spin. The machine had zero stagger, a fairly small gap-chord ratio, a round section fuselage and a gap in the centre section of the top of the upper plane. Pitching moments were measured with various elevator and tail settings, also with tail removed, over a range of incidence from  $0^\circ$  to  $45^\circ$ , and of yaw from  $0^\circ$  to  $45^\circ$ . Yawing moments were measured with the rudder at  $0^\circ$ ,  $10^\circ$  and  $20^\circ$  for three angles of yaw, namely:  $-30^\circ$ ,  $0^\circ$  and  $+30^\circ$ . The effect of closing in the centre section was found and two new rudders were designed and tested. The results showed that when the model was yawed through a large angle, the pitching moments became more positive, tending to hinder recovery from a spin. At  $20^\circ$  incidence, a yaw of  $30^\circ$  caused a change in moment which would be balanced by  $20^\circ$  change of elevator. The original rudder was ineffective and gave no control at very large incidences. With the modified tail unit the rudder control was very greatly improved, the elevator control being better at small incidences but the same at stalling. There was no indication that the gap in the centre section was the cause of any considerable reduction of control.

**Full-Scale Tests of a Bristol Fighter with Increased Rudder Control.** By H. L. Stevens, B.A., of The Royal Aircraft Establishment. Presented by the Director of Scientific Research. R. & M. No. 972 (Ae. 187). (2 pages and 2 diagrams.) April, 1925. Price 3d. net.

An attempt has been successfully made to render the standard Bristol Fighter a more satisfactory machine for inexperienced pilots who may, in some opinions, accidentally stall near the ground. A balanced rudder of 80 per cent. greater area has been fitted and the upper fin modified in shape and cambered to remove the turning tendency due to the increased height of rudder.

The rudder control is now much more powerful and more in keeping with the other controls, and the aeroplane can be brought out of a spin much quicker; cambering the fin has provided a useful method of neutralising fairly small turning tendencies. Taken all round, the opinion of the experimental squadron at the R.A.E. is that this rudder and fin is better than the standard, and considerably safer for an inexperienced pilot. It has been recommended that this fin and rudder be put into service use.

## Trawlers v. Seaplane

EXCITING times have been experienced in the Firth of Clyde lately in connection with the poaching, or illegal fishing, by trawlers in the Firth. The Fishery Board's cruiser *Vigilant* and a seaplane have been endeavouring to hunt down

the poachers, but while the seaplane has succeeded in "spotting" some of the trawlers, when it attempted to approach the latter it was driven off by means of a heavy fusillade of cotton-waste fire balls, assisted by a fire hose! Now a submarine chaser, the *Spey*, has been sent to assist in the matter.

## ROYAL AERONAUTICAL SOCIETY

### R.38 MEMORIAL PRIZE (FOURTH YEAR)

*Regulations.*—From the income of the above Fund a sum of twenty-five guineas will be offered as a prize for the best paper received by the Royal Aeronautical Society on some subject of a technical nature in the science of aeronautics. Other things being equal, preference will be given to papers which relate to airships.

The prize is open to international competition. The Royal Aeronautical Society retains the right to withhold the prize in any year if it is considered that no paper is of sufficient merit to justify an award.

Intending competitors should send their names to the Secretary of the Royal Aeronautical Society, 7, Albemarle Street, London, W.1., on or before December 31, 1925, with such information in regard to the projected scope of their papers as will enable arrangements to be made for their examination. The closing date for the receipt of papers will be March 31, 1926.

Papers, which must be submitted in either French or English, should in all cases be typed, and a copy should be retained by the author, as the Society can take no responsibility for the loss of copies submitted to it.

Successful papers will become the absolute property of the Society, and in most instances be published in the "Journal of the Royal Aeronautical Society." A signed undertaking must accompany each paper to the effect that publication has not already taken place, and that the author will not communicate it elsewhere until the award is published.

The Society attaches special importance to papers showing original work, and due acknowledgment must be made by the author of the source of any special information.

### EDWARD BUSK MEMORIAL PRIZE

*Regulations.*—From the income of the above Fund, a sum of twenty guineas will be offered as a prize for the best paper received by the Royal Aeronautical Society on some subject of a technical nature in connection with aeroplanes (including seaplanes).

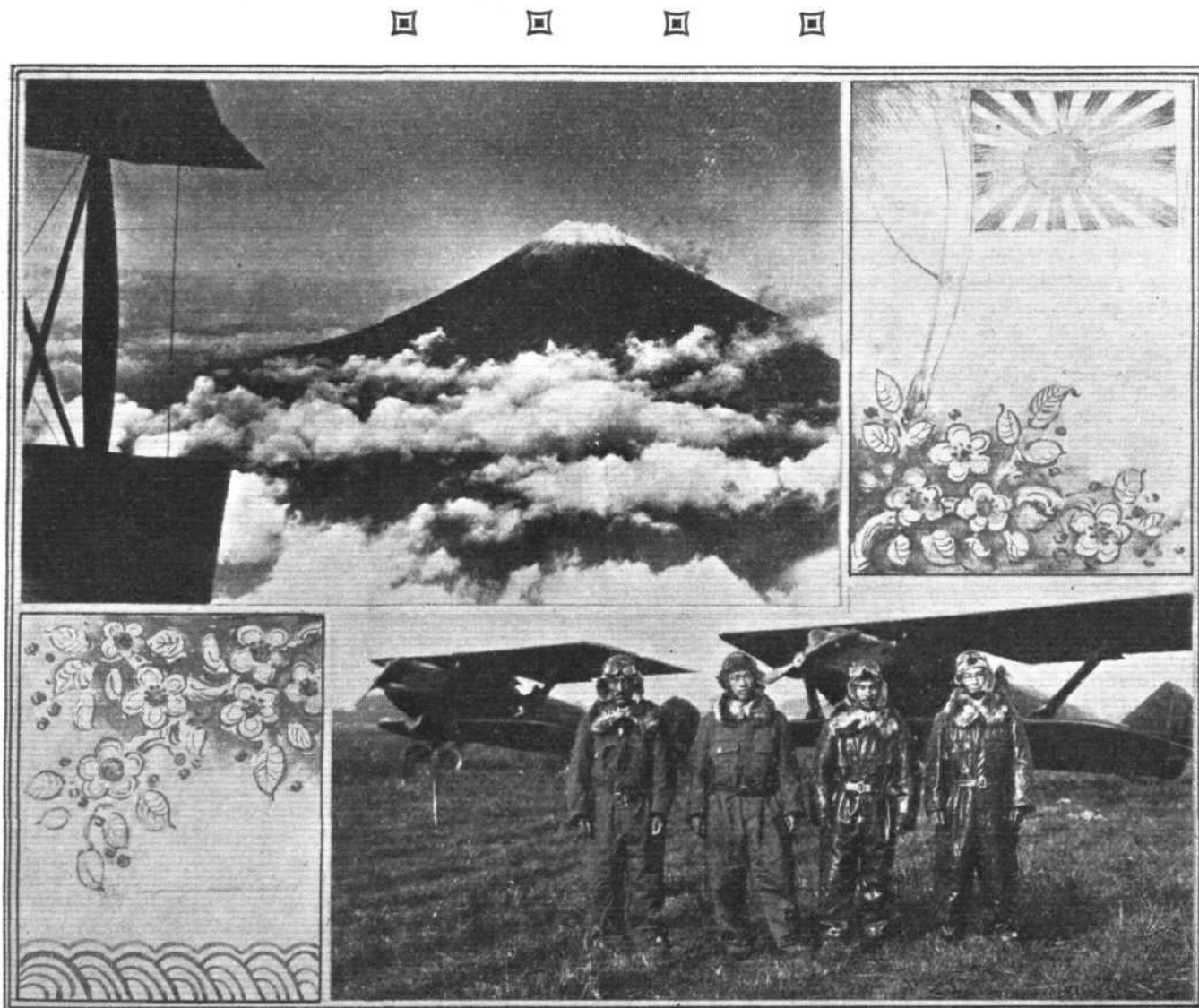
The prize is open to international competition. The Royal Aeronautical Society retains the right to withhold the prize in any year if it is considered that no paper is of sufficient merit to justify an award.

Intending competitors should send their names to the Secretary of the Royal Aeronautical Society, 7, Albemarle Street, London, W.1, on or before September 30, 1925, with such information in regard to the projected scope of their papers as will enable arrangements to be made for their examination. The closing date for the receipt of papers will be December 31, 1925.

Papers, which must be submitted in either French or English, should in all cases be typed, and a copy should be retained by the author, as the Society can take no responsibility for the loss of copies submitted to it.

Successful papers will become the absolute property of the Society, and will in most instances be published in the "Journal of the Royal Aeronautical Society." A signed undertaking must accompany each paper to the effect that publication has not already taken place, and that the author will not communicate it elsewhere until the Society's award is published.

The Society attaches special importance to papers showing original work, and due acknowledgment must be made by the author of the source of any special information.



**THE TOKYO-LONDON FLIGHT:** Having left the land of their sacred Fuji Yama last July, the four Japanese airmen shown above, Maj. Abe (extreme left) and Mr. Kawachi, the pilots, and Engineers Shinohara and Katagiri, are well on their way to London. The two Breguet biplanes on which they are flying will be seen behind the airmen, whilst above we show an aerial view of the beautiful Fuji Yama Mountain.

# THE ROYAL AIR FORCE

London Gazette, August 25, 1925

## General Duties Branch

The following are granted permanent commissions in the ranks stated (Aug. 26):  
—Flight Lieuts.—I M. Rodney (Capt., Dorset Regt.), W. R. B. Annesley.  
Flying Officer E. C. Barlow.

Pilot Officer J. H. Caulfield is promoted to rank of Flying Officer; Aug. 10.  
Wing Commander J. R. W. Smyth-Pigott, D.S.O., is restored to full pay from half pay; Aug. 25.

The following are placed on half-pay, Scale B:—Squadron Leader C. J. Mackay, M.C., D.F.C., from Aug. 23 to Sept. 13 inclusive; Flight Lieut. E. R. Whitehouse; Sept. 5. Flying Officer J. Spooner, M.M., is transferred to Reserve, Class A; Aug. 27. The following are placed on the retired list at their own request:—Air Commodore R. Gordon, C.B., C.M.G., D.S.O.; Aug. 26. Flight Lieut. E. R. C. Scholefield, A.F.C., D.C.M.; Aug. 28. The short service commissions of the following Pilot Officers on probation are terminated on cessation of duty:—T. D. Egan, C. D. Shearing, D. R. Way; Aug. 22. W. C. Barnsley; Aug. 26. The following resign their short service commissions:—Flying Officer H. C. Davies (Lieut., A. and S. H., ret'd.); Aug. 26. Pilot Officer on probation C. V. Fevez; Aug. 22.

## Stores Branch

Flight Lieut. H. V. Robbins (Lieut., Border Regt.) is transferred to Stores Branch on probation; Aug. 1.

## Accountant Branch

Flight Lieut. F. M. Gingold, M.B.E., relinquishes his short service commission on account of ill-health; Aug. 26.

## Reserve of Air Force Officers

Flying Officer S. Hampton resigns his commission; July 15. Flying Officer Lord E. A. Grosvenor resigns his commission on appointment to a commission in Auxiliary Air Force; Aug. 1. Flying Officer G. R. B. Smyth is transferred from Class A to Class C; Aug. 25. Pilot Officer A. H. A. C. Cranmer is confirmed in rank; Aug. 24.

## Auxiliary Air Force

### General Duties Branch

The following to be Squadron Leaders:—No. 601 (County of London) Squadron.—Capt. Lord E. A. Grosvenor to command the Squadron; Aug. 1. No. 603 (City of Edinburgh Squadron).—Major J. McKelvie, A.F.C., to command the Squadron; Aug. 1.

## ROYAL AIR FORCE INTELLIGENCE

**Appointments.**—The following appointments in the Royal Air Force are notified:—

### General Duties Branch

**Wing Commanders.**—R. G. D. Small, to Station H.Q., Duxford, to command. 22.9.25. J. R. W. Smyth-Pigott, D.S.O., to Air Ministry, for duty as an "Attached Officer." 25.8.25. E. L. Tomkinson, D.S.O., A.F.C., to No. 10 Group H.Q., Lee-on-Solent, for Air Staff duties. 10.9.25. P. Babington, M.C., A.F.C., to No. 5 Flying Training Sch., Sealand, pending taking over command. 6.10.25.

**Squadron Leaders.**—L. T. N. Gould, M.C., to No. 99 Sqn., Bircham Newton. 4.9.25. H. A. Michell, O.B.E., to R.A.F. Depot, on transfer to Home Estab. 10.8.25. W. H. L. O'Neill, M.C., to No. 24 Sqn., Kenley. 27.8.25. F. P. Don, to R.A.F. Depot, on transfer to Home Estab. 1.9.25. W. A. Coryton, M.V.O., D.F.C., to Schl. of Army Co-operation, Old Sarum, instead of to No. 24 Sqn., as previously notified. 26.8.25. R. Halley, D.F.C., A.F.C., to R.A.F. Cadet College, Cranwell. 7.9.25. G. D. Nelson, D.S.C., A.F.C., to Headquarters Inland Area. 1.9.25.

**Flight Lieutenants.**—B. A. Malet, D.F.C., to No. 10 Group H.Q., Lee-on-Solent. 1.9.25. A. P. Davidson, to R.A.F. Depot, on transfer to Home Estab. 16.8.25. F. O. Soden, D.F.C., to No. 24 Sqn., Kenley, instead of to Inland Area Communication Flight, as previously notified. 19.8.25. C. J. Brockbank, M.B.E., to Station Commandant, Basrah. 1.8.25. C. R. Keary, to H.Q. Spec. Reserve and Auxiliary A.F. 24.8.25.

**Flying Officers.**—T. H. R. Riggs, D.C.M., M.M., to R.A.F. Depot on transfer to Home Estab. 23.5.25. J. Evason, to Schl. of Balloon Training, Larkhill. 31.8.25. M. H. Steff, to Royal Airship Works, Cardington. 26.8.25. G. G. H. Du Boulay, to Night Flying Flight, Biggin Hill. 7.9.25. H. Nelson, to Air Ministry. 1.9.25. L. E. Maynard, to No. 25 Sqn., Hawkinge. 7.9.25.

**Pilot Officers.**—L. W. Cannon and A. V. Hammond, to No. 2 Sqn., Manston. T. N. McEvoy, to No. 41 Sqn., Northolt. J. Eaton, W. M. C. Kennedy and T. H. Carr, to No. 7 Sqn., Bircham Newton. B. A. C. Danbury, R. C. Wilson, C. H. G. Bremridge, and J. G. D. Armour, to No. 207 Sqn., Eastchurch. H. H. V. Tristem, R. Kellett, and B. W. Knox, to No. 3 Sqn., Upavon. T. E. Worsley and G. E. G. Lywood, to No. 39 Sqn., Spittlegate. G. P. Chamberlain and J. D'A. Keary, to No. 25 Sqn., Hawkinge. A. D. Gillmore, to No. 13 Sqn., Andover; J. A. P. Harrison, to No. 99 Sqn., Bircham Newton; E. G. Hordern, to No. 17 Sqn., Hawkinge. J. R. Jones and F. M. V. May, to No. 4 Sqn., S. Farnborough. H. L. Patch, to No. 58 Sqn., Worthy Down. All the above Pilot Officers are posted on appointment to Permanent Comms. from R.A.F. (Cadet) College with effect 31.7.25. A. P. Wayte, to No. 4 Flying Training Sch., Egypt. 21.8.25. L. A. Egglefield and H. Walker, to No. 208 Sqn., Egypt. 6.8.25.

### Stores Branch

**Squadron Leaders.**—E. W. Havers, to Packing Depot, Ascot. 1.10.25. H. T. Foxen, to No. 7 Group H.Q., Andover. 26.8.25.

**Flying Officers.**—H. J. Bamber, to Schl. of Naval Co-operation, Lee-on-Solent. 1.9.25. R. W. Stewart, to R.A.F. Depot (Non-effective Pool), on transfer to Home Estab. 26.8.25.

### Medical Branch

**Flying Officers.**—F. B. C. L. Crawford, M.B., and H. G. Maguire, to Research Lab. and Med. Officers' Sch. of Instruction, on appointment to Short Service Comms. for short course. 25.8.25. J. McM. Wilder, to Research Lab. and Med. Officers' Sch. of Instruction on appointment to Short Service Comm. for short course. 24.8.25.

## NAVAL APPOINTMENTS

The following appointments were made by the Admiralty on August 26:—

### Royal Air Force

**Flying Officers.**—W. D. Gairdner, D.F.C., to R.A.F. Base, Gosport. A. A. B. Chipper, to No. 405 Flight. A. Leslie-Moore, to R.A.F. Base, Gosport. F. E. Vernon, to Inland Area Aircraft, and C. McL. Reid, to R.A.F. Depot (Aug. 5), and C. M. E. Gifford (Hon. F. Lt.), to Armament and Gunnery School (Aug. 7).

### Royal Air Force (Cadet) College

The following Flight Cadets successfully completed, on July 29, 1925, their

course of training at the R.A.F. (Cadet) College. The names are arranged in alphabetical order:—J. G. D. Armour (winner of R.M. Groves Memorial Prize), C. H. G. Bremridge, L. W. Cannon, T. H. Carr, G. P. Chamberlain, B. A. C. Danbury, J. Eaton, A. D. Gillmore, A. V. Hammond, J. A. P. Harrison, E. G. Hordern, J. R. Jones, J. D'A. Keary, R. Kellett, W. M. C. Kennedy, B. W. Knox, G. E. G. Lywood, F. M. V. May, T. N. McEvoy (winner of Sword of Honour), H. L. Patch, F. Priestman, H. H. V. Tristem, R. C. Wilson, T. E. Worsley.

The Abdy Gerrard Fellowes Memorial Prize, was won by Flight-Cadet R. Costa.

## ALL THE WORLD'S AIRCRAFT\*

"ALL THE WORLD'S AIRCRAFT" for 1925 has just made its appearance, and once again several improvements on previous issues are to be found. The new shape adopted last year is, we are glad to see, retained, for in its original form—when it was known as "Jane's All the World's Aircraft"—this extremely useful reference book was undoubtedly somewhat awkward to handle.

In the 1925 edition—the 15th—some really important additions have been introduced. For instance, a complete list of the air lines of the world, together with brief particulars of each service, is given. Following this list is another giving "Noteworthy Flights of the Year," and the principal world's records.

Another very important new feature consists of an index of aeroplanes, engines, and airships, in which individual types are given under their own names—as distinct from the makers' names—and their type letters and numbers. This should greatly facilitate looking up any particular aircraft or engine, especially when only the type name is known and not the maker's, or vice versa—and this frequently occurs.

\* "All the World's Aircraft." Compiled and edited by C. G. Grey. Founded 1911 by Fred T. Jane. Sampson Low, London. £2 2s. net.

In other respects the contents follow on the lines of last year's issue. It is divided into four main sections: Part A.—The World's Aeronautical Progress, consisting of historical notes on the year's work of each nation (alphabetically arranged) in military, naval and civil aviation. Part B.—All the World's Aeroplanes, including sections on helicopters and gliders. Part C.—All the World's Aero Engines. Part D.—All the World's Airships.

As before, Capt. W. H. Sayers has contributed largely to the technical side. Many new types are to be found in this volume, and it is interesting to note that the British and German sections have grown considerably since last year. We also note from a perusal of the section devoted to the United States—especially the historical section—that a considerable amount of new and interesting matter is to be found dealing with the increased activity in aerial matters taking place of late in the Land of the Free—and Dry. Nearly fifty countries are represented, and the data referring to same is, considering the extremely difficult task presented to the compilers of such a book, remarkably complete and up-to-date.

Space will not permit a detailed review of this book, and we can only conclude by saying "Get it, and see for yourself."

## AIR POST STAMPS

By DOUGLAS B. ARMSTRONG

### Livorno-Rome Special Flight

ON June 28, 1925, a special air post flight was made, by authority of the Italian Ministry of Posts, from Livorno to Rome on the occasion of the assembly of the Twelfth Italian Philatelic Congress in the former city. Two official cachets were supplied, the one circular in form and the other oblong, both containing the words "POSTA AEREA ECCEZIONALE." The round stamp was discarded after only a few letters had been cancelled owing to a mis-spelling of the word "eccezionale," so that the majority of the 3,000 letters, etc., carried bore the impression of the oblong cachet. These postmarks were officially destroyed when the aerial mail had been despatched. Flown covers carried a souvenir *etiquette* issued by the Congress Committee, with a vignette of Romulus and Remus, with the she-wolf on the left and a Roman trireme on the right, printed in lilac in small sheets of 16, and perforated 11 by 11½, of which 5,000 copies only were provided.

### First Aerial Parcels Post

AN interesting discovery in connection with the history of the air post in Great Britain is a vignette issued as far back as 1913 by the firm of Robt. Sinclair, Ltd., of Newcastle-on-Tyne, for a series of parcel flights from Gosforth Park to Seaham Harbour and Blyth. These flights were operated by Mr. B. C. Hucks between February 11 and 18, 1913, by means of a 80 h.p. Bleriot monoplane, which is depicted on the stamp in flight over the city. The stamp is printed in deep green with the words "First Aerial Delivery" above the picture, and "By The Robert Sinclair Tobacco Co., Ltd., Newcastle-on-Tyne, Feb., 1913." beneath. Although much publicity was given to the affair at the time, very few of these vignettes appear to have been preserved.

### Canada's Northern Air Service

THE semi-official Canadian air post service between Haileybury, Ont., and the Rouyn Goldfields, suspended since January last, was resumed on June 27, 1925, under the auspices of the Northern Air Service, Ltd., of Haileybury, by whom a special aero stamp has been issued with the approval of the Post Office Department to represent the supplementary air post fee of 25 cents. Printed in blue, with white lettering it bears the title of the operating firm above a winged device and the inscription "Special Air Delivery" across the foot. A special cachet was also used on the occasion of the first flight of the new service, when flown covers were signed by the pilot "B. W. Broatch."

### Albanian Air Post

AFTER many delays, the Albanian air post service promoted by the Adria Aero Lloyd, finally came into operation on May 30, 1925, when an aeroplane left Tirana for Valona, carrying about 1,000 letters, which were impressed with a departure cachet inscribed "Tirana Posta Aerore," and with another bearing the date 30 V. 25 on arrival at Valona. A special flight from Tirana to Scutari in aid of the Red Cross took place also on June 1, and on this occasion a cachet lettered "ler vol. Tirana-Scutari" was employed.

### Air Stamps from Honduras

SOME time ago we recorded the establishment of an air post service in this Central American State, in connection with which special cachets were employed. Now we have received a set of air post stamps in the form of regular postage types of 1915 overprinted "Aero Correo" in two lines of small Roman capitals, as follows:—5 centavos blue, 10 c. deep blue, 20 c. red-brown, 25 c. purple-brown, 50 c. rose, and 1 peso green.

### Forthcoming Brazilian Air Stamps

THE preparation of a series of air post stamps for Brazil is authorised by the Presidential Decree, dated May 31. The subjects of the designs are to symbolise the rise and progress of aerial navigation, and one of the values at least will bear the likeness of Santos Dumont. Although these stamps are primarily intended for use in the air post service, they will be available for ordinary postage pending the opening up of the air mail routes.



### Bombing 'Plane's Fall into Channel

ON August 26 a D.H.9A bomber of No. 207 Squadron, Eastchurch, made a forced landing in the English Channel, off Deal. The machine rapidly began to sink, and the two occupants were rescued just in time by the crew of a pleasure motor-boat. Subsequently the wrecked machine was salvaged.

## PUBLICATIONS RECEIVED

*Aeronautical Research Committee, Reports and Memoranda:* No. 963 (Ae. 179.) Notes on Stalled Flying. By Sqdn.-Ldr. R. M. Hill, M.C., and H. L. Stevens. October, 1922. Price 6d. net. No. 963 (Ae. 180.) The Control of a Stalled Aeroplane as Affected by the Use of Differential Ailerons. By H. L. Stevens. November, 1924. Price 6d. net. No. 965 (Ae. 181.) Pitching and Yawing Moments with Sideslip on a Model Aeroplane with Zero Stagger. By F. R. Bradfield. January, 1925. Price 1s. net. No. 970. Report of the Airworthiness of Airships Panel. October, 1924. Price 9d. net. H.M. Stationery Office, Kingsway, London, W.C.2.

*Marconi's Wireless Telegraph Co., Ltd. Report of the Directors and Statement of Accounts for the Year ended December 31, 1924.* Marconi's Wireless Telegraph Co., Ltd., Marconi House, Strand, London, W.C.2.

*National Health and Unemployment Insurance of Personnel of the Royal Air Force.* Air Publication 980. May, 1925. H.M. Stationery Office, Kingsway, London, W.C.2. Price 2d. net.

*The Air Pilot Monthly Supplement.* No. 10. August, 1925. Air Ministry, Kingsway, London, W.C.2.

*The Record of the Bristol "Cherub" Engine in the Air Races at Lympe.* The Bristol Aeroplane Co., Ltd., Filton House, Bristol.

*The Elevator; The Official Bulletin of the Lancashire Aero Club.* Edited by Rex Williams. The Lancashire Aero Club, Manchester.

*Air Publication 1109.* April, 1925. *Provisional Regulations in Regard to the Entry and Training of Boys as Clerks in the Royal Air Force.* Air Ministry, Kingsway, London, W.C.2.

*Instructions Regarding Training in the Manœuvre Area for 1925.* Issued by the General Staff. The War Office, London.

*The Elimination of Interference from Radio Receiving Apparatus.* Air Publication 1136. June, 1925. H.M. Stationery Office, Kingsway, London, W.C. Price 2d. net.

*The Michell Viscometer.* Third Edition. Michell Bearings, Ltd., South Benwell, Newcastle-on-Tyne.

*A Flying Visit to the Middle East.* By Sir Samuel Hoare. The Cambridge University Press, Fetter Lane, London, E.C. Price 3s. 6d. net.

### Catalogues

"Quicklift" Patent Ratchet Jack. The Quicklift Engineering Co., Ltd., 14, New Street, Birmingham.

Englebert Motor Car and Motor Cycle Tyres. Englebert Tyres, Ltd., 162, Great Portland Street, London, W.1.



## AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

### APPLIED FOR IN 1924

Published September 3, 1925

- 11,292. VICKERS-PETTERS, LTD., E. W. PETTER and J. HUTTON. I.c. engines. (237,990.)  
15,795. H. C. PRATT. Aircraft landing mechanism. (238,050.)  
16,751. R. A. BIBARD. Aeroplanes. (219,022.)  
27,352. OPTISCHE ANSTALT C. P. GOERZ AKT.-GES. Means for locating aircraft in space. (224,917.)

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